

Sept. 8, 1986

Chemical Marketing Reporter

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CHEMICAL MARKETING QUEST

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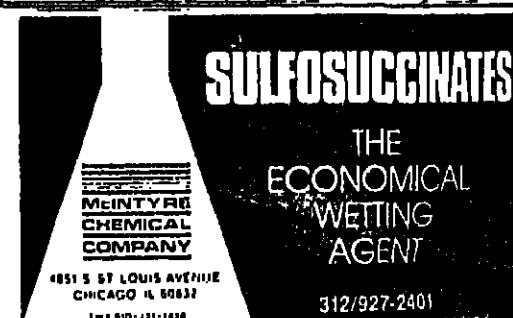


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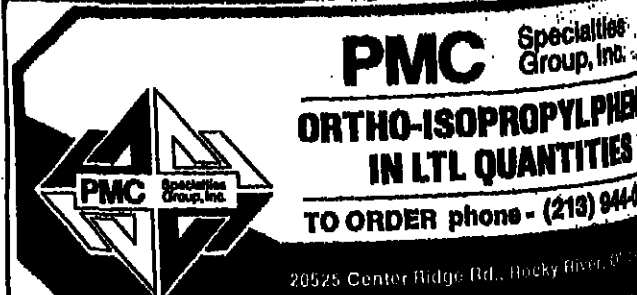
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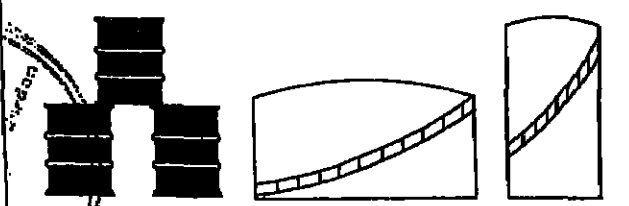
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CHEMICALS SHIPPING '86



CMR Reports 29

NEWSPAPER

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SEPTEMBER 22, 1986

22nd anniversary year

INSIDE CMR

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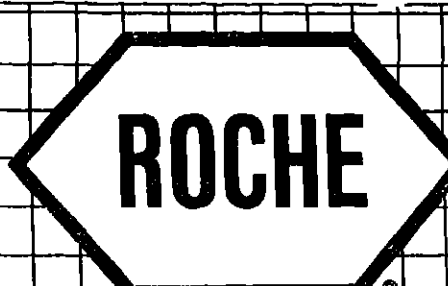
BASF'S PLASTICS: The big chemical producer is emphasizing engineering resins in its plastics operations, while restructuring commodities. Page 7

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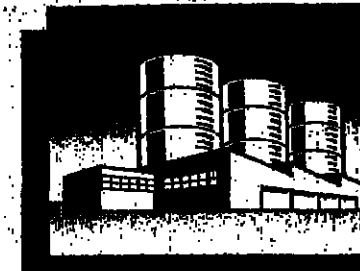
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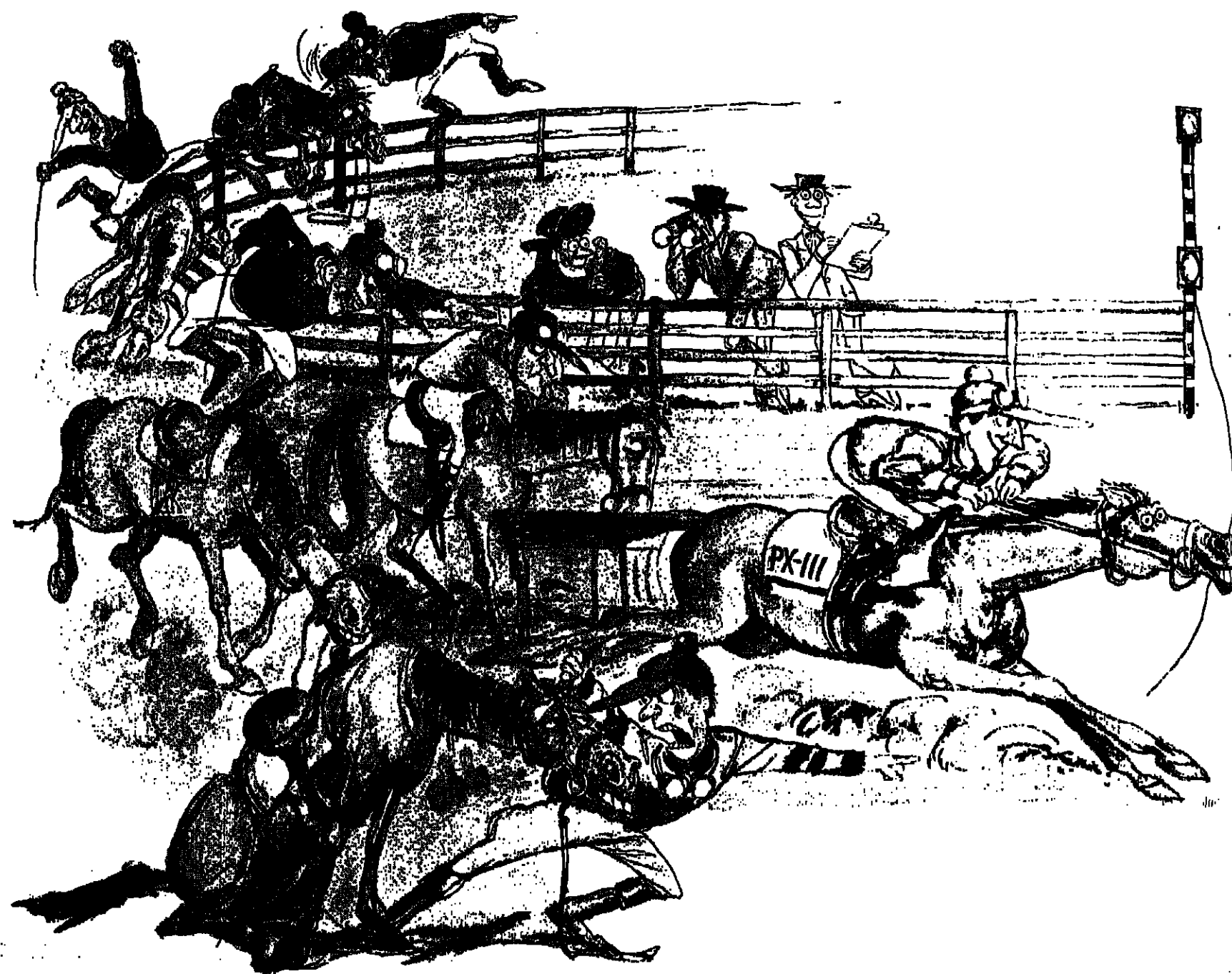
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Olin, Du Pont Boost Electronics

Two major US chemical firms took steps to enlarge their presence in the electronics industry last week. E.I. du Pont de Nemours & Co. purchased Tau Laboratories, Inc., Poughkeepsie, N.Y., a maker of photomask products used in integrated circuits production for \$45 million in common stock. At the same time, Olin Corporation formed a joint venture with Asahi Glass Company Ltd., Tokyo, Japan, to produce thick-film ceramic substrates for the electronics market.

Du Pont's acquisition accompanies a corporate reorganization designed to set up business units to service Du Pont's electronics, printing and industrial imaging and health-care industries. One unit will be

called the imaging systems department, another, the electronics department, and a third unit will be renamed the medical products department.

Tau Laboratories will join the electronics department. Du Pont says Tau is the only fully integrated maker of photomask products (which also includes photomask blanks and pellicles) in the world.

The company has the largest electron beam manufacturing capacity in the domestic private sector, Du

Continued on Page 15

OLIN RESEARCH: The company's metals research laboratories help keep the company competitive in high performance alloys, specialty products for electronics.



ICI Plans to Restructure Commodity Chemicals Units

Imperial Chemical Industries, PLC, said last week that it will merge its four commodity chemical operations into a single entity, which will be incorporated later as a separate, wholly-owned subsidiary, to be called ICI Chemicals & Polymers Limited.

Sir John Harvey-Jones, ICI's chairman, said the reorganization reflects the company's "determination to remain in and further develop its business in commodity chemicals and associated downstream products."

The company also said it intends to take "maximum advantage" of cost-saving opportunities, including reductions in employment. The new group will have over 38,000 employees, mostly in the UK.

ICI said it has no plans at the moment to close or sell any of the businesses within the new group, "but we don't close any doors for the future," a spokesman also added.

The new group will mostly consist of ICI's agricultural, fibers, Mond, and petrochemicals and plastics divisions, which had combined worldwide sales of approximately \$9.8 billion last year, accounting for 82 percent of ICI's total sales, and profits of approximately \$520 million, representing 36 percent of total earnings.

The reorganization of ICI's European commodity chemical operations follows the restructuring of the UK company's US businesses this Spring under the banner of ICI Americas, Inc. (CMR 6/2/86, pg. 7).

The US currently accounts for more than 15 percent of ICI's worldwide business, and

the company expects to increase the US share to around 25 percent by the early 1990's.

In August, ICI agreed to acquire the North American paint, coatings, resins and "Macco" adhesives businesses of Glidden from Hanson Industries for \$580 million in cash (CMR 8/18/86, pg. 7). Hanson bought the businesses through its acquisition of SCM Corporation earlier this year.

ICI said in August that the purchase of the Glidden assets would "accelerate dramatically" the company's expansion in the \$25 billion world paint market and add to ICI's resistance to cyclical downturns in commodities — a major corporate objective.

Commenting further on the reorganization announced last week, Mr. Harvey-Jones said the move "will enable us to strengthen our position as one of the most efficient chemical companies in Europe."

Dick Lindsell, chairman of ICI's Mond Division, will serve as chief executive of the new group. Other members of the group's board of directors will include Brian Appleton, David Beynon, Rodney Brown, Ralph Hodge and Donald Mackay.

Non-executive board members will include Frank Whiteley, chairman, and Sir Robin Ibbis and Alan Clements, all board members of the parent company.

The new group will consist of the following business groups: fibers, fertilizers, petrochemicals, chemical products, general chemicals, chlorine and derivatives, plastics, resins and surface coatings intermediates, acrylics, catalysts and technology licensing, and mineral products.

Fluorocarbon Group Calls For a Cap on Production

A coalition of US chlorofluorocarbon producers and users called on the Reagan Administration last week to help negotiate, if necessary, a global cap on CFC production capacity.

Directors of the Alliance for Responsible CFC Policy approved a seven-point policy statement regarding US policy on the chemicals some scientists have linked to ozone depletion.

The policy calls, for the first time, on the US government to work "in cooperation with the world community under the auspices of the United Nations Environment Programme (UNEP) to consider establishing a reasonable global limit on the future rate of growth of fully halogenated CFC production capacity."

Richard Barnett, chairman of the alliance which represents 500 companies, including the major producers, said he considers the statement to be an outline of responsible US policy with regard to CFC's that is "compatible with current scientific understanding and consistent with the original goals of the CFC alliance."

Environmental Protection Agency has proposed, but not implemented, rules to cap and eventually reduce CFC production based on the theory that the chemicals are emitted into the atmosphere and reach the earth's protective ozone layer, where they may de-

plete the ozone through a complex series of reactions.

However, more than a decade of scientific studies by the industry and government have yielded conflicting results regarding the impact of CFC's on the ozone layer.

"The alliance does not believe that the scientific information demonstrates any actual risk from current CFC use, or emissions," says Mr. Barnett.

"We recognize, however, the growing concern for potential ozone depletion and climate change as a result of large future growth of CFC emissions and the buildup of other trace gases in the atmosphere," he adds.

Mr. Barnett says the industry supports further scientific research and believes that regulatory policies should be periodically re-examined in the light of additional findings.

"We believe that large future increases in fully halogenated CFC's would be unacceptable to future generations and, in our view, it would be inconsistent with the goals of this alliance to ignore the potential for risk to those future generations," says Mr. Barnett.

In addition to supporting a worldwide limit on some types of production, the coalition's policy statement calls for the adoption of voluntary conservation programs by CFC users; the continuation of research into adequate substitutes; the continuation and

Continued on Page 48

Chemical Marketing Reporter

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Linear Olefins Makers In Expansion Round

World consumption of linear olefins will grow by 10 percent per year through the end of this decade, with estimates of continued expansion ranging from 3 to 8 percent from 1990 to 1995.

Producers in the US and overseas are responding to the rising need with plans for plant expansions, and in some cases, new grassroots facilities.

In England, Shell Chemicals UK Limited said last week that it had completed the first two phases of a debottlenecking project at its Stanlow Shell higher olefin process (SHOP) plant.

The plan calls for a 110-million-pound capacity increase to be completed in a final phase next year. Total annual capacity will then be 485 million pounds of linear alpha olefins and internal olefins combined.

Chemopetrol, the group which oversees chemical production in Czechoslovakia, is reportedly negotiating with Ethyl Corporation, Chevron and Lummus for licensing of a new linear olefins plant in Czechoslovakia by 1991.

In addition, a 175-million-pound-per-year unit is currently being built in the U.S.S.R. with technology licensed in 1979 from Ethyl Corporation.

In Japan, Idemitsu Petrochemical Com-

pany is calling for a 450-million-pound-per-year unit to be built in Japan by 1990. Mitsubishi already has a 660-million-pound-per-year unit in Mizushima, Japan.

At home, all three producers have expansion plans. Chevron Chemical Company says it will have 50 million pounds more annual capacity on line at its Cedar Bayou unit by November 1.

Total capacity after the expansion will be 250 million pounds per year of single C₄ through C₁₂ cuts with multiple cuts in the C₈ plus range.

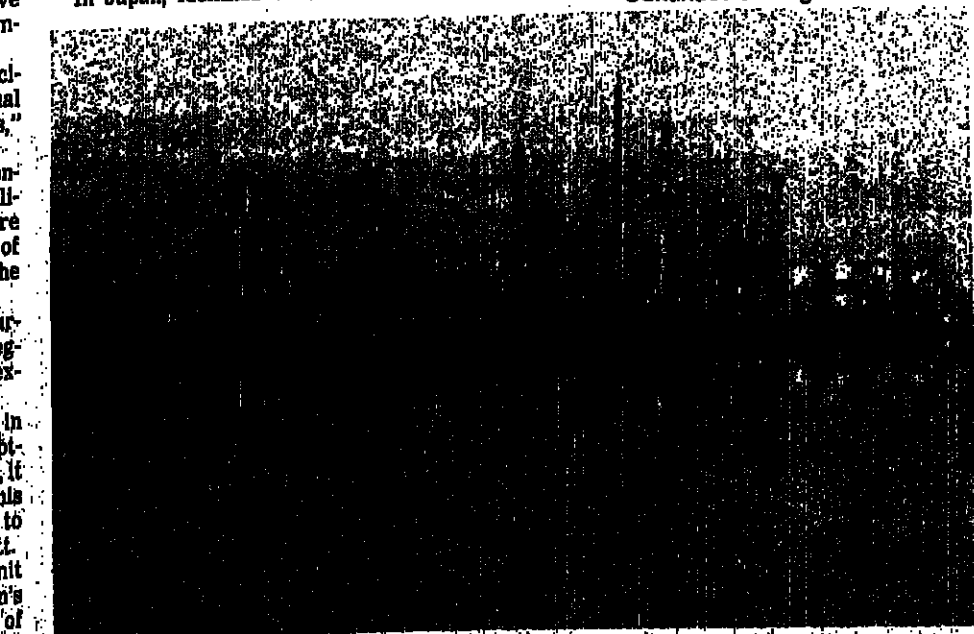
Ethyl Corporation has announced plans to expand its 800-million-pound-per-year facility by about 150 million pounds by mid 1987. The expansion will focus on C₄ through C₁₂ chain lengths.

Shell Chemical Company USA has completed a capacity expansion at its Geismar, La. unit, which brings its total annual capacity to 800 million pounds per year of alpha and internal olefins.

The increased need for linear olefins is being driven primarily by copolymer consumption for linear low-density polyethylene. This growth is coming largely at the expense of conventional low-density polyethylene, according to observers.

While total worldwide demand for low-

Continued on Page 17



SHELL'S SHOP: Overall view of the Shell higher olefin process plant at Stanlow in the UK. The company is moving ahead in its worldwide expansion program for building block alpha-olefins made by the process.

Ceramics, Polymers, Composites Are a Key for US Manufacturers

New structural materials, such as ceramics, polymers, metals and composites, hold the promise to renew the US's international competitiveness in manufacturing, according to a report released last week by the Congressional Office of Technology Assessment. The report was released at an oversight hearing by the House science and technology materials subcommittee on the White House's national critical materials council. It notes that products ranging from cutting tools to tennis rackets are being made from these new materials, but some applications that have been considered promising may not pan out.

For example, OTA says structural ceramics will not be used extensively in passenger car engines before the year 2000. Before polymer composites can compete with steel in mature, commercial applications such as structural automobile components, new high-volume, low-cost manufacturing technologies must be developed.

Even so, these materials will provide many other opportunities in aerospace, automotive, industrial, medical, and construction industries in the next 25 years, according to OTA.

In the next ten to fifteen years, military applications are likely to grow very rapidly and, on the commercial side, biocompatible materials which can be implanted in the body could provide a major market.

Since other industrialized countries are competing actively for the large commercial and military markets, the US cannot take for granted that it will capture these markets, OTA reports.

Although the US has a technological lead in the development of some materials, particularly for military applications, it often lags in developing commercial products. By con-

Continued on Page 18

Sabic's Sharq Unit Receives Financing

Eastern Petrochemical Company (Sharq), a joint venture of Saudi Basic Industries Corporation and a 66-company Japanese consortium led by Mitsubishi, has signed a revolving and term loan agreement involving 12 national and international banks.

The agreement covers the final 10 percent financing of the company's Al Jubail, Saudi Arabia, petrochemical plant and includes loans for \$28.5 million Saudi riyals (about \$80 million) and for \$20 million. The dollar portion will be used for financing that requires payment in that currency, Sabic says.

Sharq came on stream last year with design capacity of 130,000 metric tons per year of linear low-density polyethylene and 300,000 tons of ethylene glycol. In the first year of commissioning the plant produced 31,000 metric tons of LLDPE and 49,000 tons of EG, the company says.

J&J Loses Bid On Recall Costs

A Federal judge in Newark, N.J., last week ruled that Johnson & Johnson's product liability insurance does not cover the costs associated with the company's 1982 recall of its "Tylenol" product.

The company recalled the product after the deaths of seven Chicago area residents, who took cyanide-laced "Tylenol" capsules. The incident, which has been repeated elsewhere since, led to a nationwide move toward tamper-resistant packaging.

Although Johnson & Johnson cancelled its recall insurance prior to the tampering cases in Chicago, the company argued that recalls costs of more than \$100 million should be covered by its regular product liability insurance.

It was unclear last week whether Johnson & Johnson would appeal the ruling. The Proprietary Association, an industry trade group, called the ruling last week "troubling." Many drug firms reportedly do not carry recall insurance because of high costs.

DSM Will Extend Phosphate Activity

DSM has signed a cooperative agreement with its main phosphate supplier, Office Cherifien des Phosphates (OCP) of Morocco, which will extend the Dutch company's activities in the phosphate area.

The agreement in principle includes joint development of the phosphate-processing facilities of DSM Messtoffen BV at Rotterdam. DSM Messtoffen is the Dutch affiliate of the company's agricultural division.

Located at the Rotterdam site are a 220,000-metric-ton-a-year phosphoric acid plant, a 170,000-ton ammonium phosphate plant and a mixed fertilizers plant with capacity for 270,000 tons of product per year.

OCP, with know-how in phosphate production and processing, will work with DSM Messtoffen, which has concentrated on developing its ammonia technology, to expand phosphate activities. A definitive agreement is expected to be signed in the first half of 1987.

ITC Says Urea May Be Dumped

International Trade Commission says there is a reasonable indication that the nitrogen fertilizer industry in the US is being injured by imports of urea from three Eastern Bloc nations that are allegedly being sold at less than fair value.

The commission's 5-0 vote in favor of continuing the antidumping investigation came six weeks after a coalition of domestic nitrogen producers filed the complaint against East Germany, Romania and the Soviet Union, (CMR, 7/21/86, pg. 3).

Urea imports from the Eastern Bloc have risen steadily since 1982, when they had a 2 percent share of the US market. In 1985, non-market economy imports accounted for 11 percent of the market. Another surge of urea imports has pushed the market share figure up to 18 percent, domestic producers say.

Du Pont Contracts For a Power Plant

O'Brien Energy Systems, Inc., Philadelphia, Pa., has signed a letter of intent with E. I. du Pont de Nemours & Co. for a \$40 million project which would be developed at Du Pont's Repauno chemical plant in Gibbstown, N.J., to supply steam up to 60,000 pounds per hour for twenty years.

Electricity would be sold to local utilities on long-term contracts.

The 43-megawatt Du Pont project would be the third facility for the company in O'Brien's development backlog. An \$80 million, 97 megawatt plant is planned for Du Pont's Parlin, N.J. chemical facility and a \$47 million, 38-megawatt plant will furnish steam to its Antioch, Calif. facility.

Eval Completes Unit For New Copolymers

Eval Company of America, a joint venture of Enron Company and Kuraray Company, Osaka, Japan, has completed its ethylene-vinyl alcohol plant at Pasadena, Tex.

The new plant, designed to produce 22 million pounds annually of EVOH, is the first such grassroots plant in the US. Eval notes, Commissioning work on the plant began in August with commercial production expected in the fourth quarter of 1986.

For the past three years, the company has imported "Eval" resins from Kuraray. The copolymer resins are said to offer outstanding gas barrier properties, as well as resistance to odor and flavor penetration.



DEQUSSA RAD: Degussa Ag has completed its \$25 million research laboratories at Hanau-Wolfgang. Forty laboratories and accompanying offices and ancillary room comprise the project, under construction for two years.

Mitsubishi Starts On Alcohols Unit

Mitsubishi Chemical Industries Limited will begin production of isononyl alcohols at its Mizushima oxo alcohols plant in Japan. The company says it will accomplish this with an expansion of its 2-ethylhexanol unit.

The plant has an annual capacity of 120,000 metric tons for 2-EH. After the expansion, which will be completed by the middle of next year, capacity for 2-EH will be 125,000 metric tons and capacity for isononyl alcohols will total 25,000 metric tons annually.

The company says it is reorienting its production to accommodate expanding demand for di-isononyl phthalate as a plasticizer for high temperature resistant plastics. Demand for linear alcohols for plasticizer uses "is leveling off" according to Mitsubishi.

Air Products Unit Going to Raytheon

Air Products & Chemicals, Inc. has agreed in principle to sell the domestic operations of Stearns Catalytic World Corporation, Inc. to United Engineers & Constructors, Inc., a subsidiary of Raytheon Corporation, for about \$45 million.

Stearns Catalytic is a Denver-based engineering and construction firm that services energy, mining, petrochemical and other industries. The firm is an outgrowth of Air Products 1982 purchase of Stearns-Roger, Inc., which was later merged with Air Products Catalytic, Inc. The firm currently posts services revenues in excess of \$200 million a year.

Monsanto Completes An Emulsion Project

Monsanto Chemical Company says its resins division has completed a project under way since 1984 to upgrade the facilities of its Indian Orchard plant at Springfield, Mass. The plant produces emulsions sold to adhesives manufacturers. Major feature of the project is addition of Fisher International, Inc.'s "Provox" instrumentation system.

The system reduces batch-to-batch variations, increasing the quality of the "Gelva" multipolymer and acrylic emulsions produced at the plant, according to R.E. Cummins, director of manufacturing for the resins division.

Polyester Project Set

Chemtex Fibers, Inc. has been awarded a contract with Tong Kook Synthetics Fibers, Gumi, Republic of Korea, for a 10,000-metric-ton-a-year expansion of polyester FOY yarn. The project represents an expansion of the original facility engineered by Chemtex and brought on stream in April 1985. Based on ICI technology, the process includes continuous polymerization and direct spinning.

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ALUMINUM CUTBACK: Aluminum Company of America said last week it will close permanently 144,000 metric tons of aluminum capacity as part of its rationalization program.

Alcoa Closes More Capacity; Keeps 1 MM Tons

Aluminum Company of America has added 144,000 metric tons of capacity to its primary aluminum smelter rationalization program. Alcoa says 105,000 tons of smelting capacity at Rockdale, Tex. and 39,000 metric tons at Massena, N.Y., both currently idle, will be permanently closed as part of the company's plan to eliminate 350,000 metric tons of smelting capacity.

Including the Rockdale and Massena capacity write-downs, Alcoa has eliminated 274,000 tons of primary smelting capacity. The company shut 15,000 tons last December in Anderson County, Tex., and closed a 115,000 ton smelter in Vancouver, Wash. in June.

Alcoa says it still has 1.1 million metric tons of smelting capacity, including 88 percent of capacity, in the US and Surinam, South America.

The Alcoa rationalizations are part of a vast restructuring of the high-cost US primary aluminum smelter industry. Stuart Spector, president of New York-based Spector Report, a market research firm, says that at the end of 1986, operational US primary

Continued on Page 68

Polysar Deals With Monsanto For Polystyrene

The plastics division of Polysar, Inc. has completed its purchase of the US polystyrene businesses of Monsanto Company. Negotiations leading to the purchase were announced in May (CMR, 5/19/86, pg. 9).

Polysar said the acquisition will be financed from existing company sources, but the purchase price was not disclosed.

Under the terms of the purchase, Polysar has acquired the Monsanto polystyrene manufacturing equipment at Springfield, Mass. and Decatur, Ala. Monsanto retains polystyrene at its Addyston, Ohio plant, but will operate the polystyrene production lines exclusively for Polysar.

Included also is the polystyrene technology and goodwill of Monsanto related to the "Lusitree" product line. Polysar already has polystyrene plants in Leominster, Mass. and Copley, Ohio, as well as Canadian plants at Cambridge, Ontario, and Montreal, Quebec.

Acquisition of the Monsanto plastics business will boost Polysar's annual production of polystyrene grades to some 860 million pounds. Polysar's plastics division general manager, Ian Chesney, points out that the acquisition puts Polysar among the three top polystyrene producers in North America.

Middle East Chemicals 'Essentially' on Market, Says Sabic Executive

The "threat" of Middle East petrochemical production overhauling the world market is no longer an issue, according to an executive of Saudi Arabia's Saudi Basic Industries Corporation, who maintains that most of this production is essentially in the world market now and that most Middle East plants are in full production.

Dr. Abdulaziz Al-Jarbou, Sabic's director general of projects, adds that in the long-term much of this production, particularly the plastics segment, will be consumed in the Middle East and nearby regions so that the amount marketed in the rest of the world will gradually decline.

Speaking before a joint meeting of Chemical Marketing Research Association and the chemical marketing and economics division of American Chemical Society at Newport Beach, Calif., Dr. Al-Jarbou said there is reason to hope that changing economics, increasing GNP and lower inflation will stimulate petrochemical growth beyond levels anticipated as recently as 1985.

While admitting that the petrochemical industry is viewed by many in the financial

community and senior chemical company management as a "cash cow" rather than an area warranting new investment, the industry has rationalized and restructured in the recent past, with 7 million to 8 million metric tons of worldwide ethylene capacity being taken out of production. (The total includes 3 million tons in West Europe, 2.5 million tons in the US and 2 million tons in Japan).

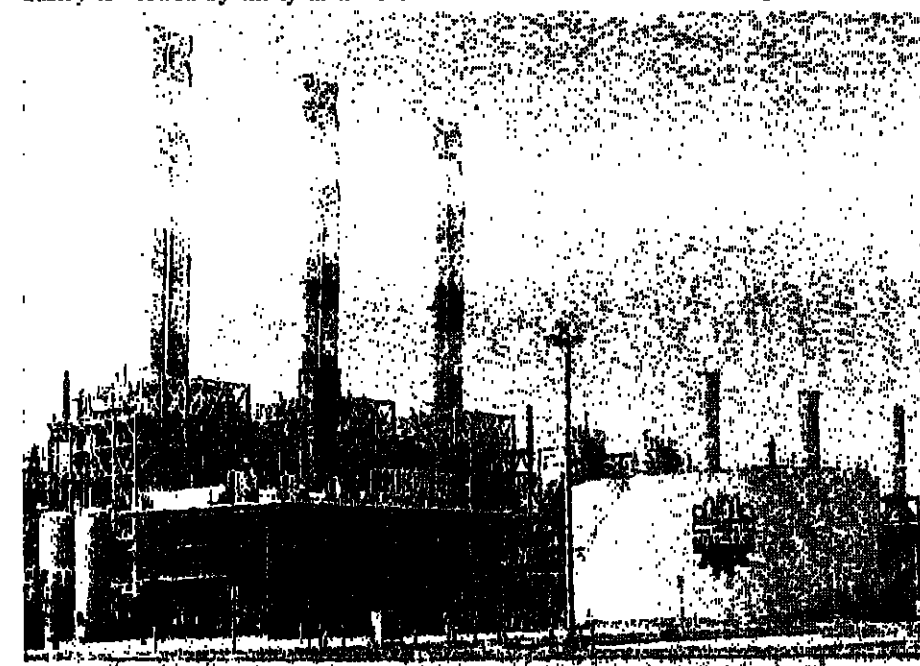
Rationalization of excess capacity is continuing, he says, with more marginal and inefficient plants due to be closed.

The Sabic executive asserts that world demand for petrochemicals is picking up while capacity has declined and desires to increase capacity have subsided, leaving a better supply/demand balance. An industry that is growing at 4 to 5 percent per year "is not doomed to oblivion," he adds.

Using ethylene as an indicator of petrochemical activity, Dr. Al-Jarbou points out that OECD countries account for 38 million metric tons of capacity, equivalent to 70 percent of total world capacity.

Contrasted to this, the Middle East has 2.3 million tons of ethylene capacity, equivalent to 4.3 percent of the world total. He feels the

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MIDDLE EAST CHEMICALS: Most Middle East petrochemical plants are in full production now and the bulk of production is being distributed globally without major disruption, says a Saudi Basic Industries Corporation official. Petrochemical plant above, on stream since the second quarter of 1986, has annual ethylene capacity of 800,000 tons.

Roche Sues Genentech On Human Growth Hormone

Hoffmann-La Roche, Inc., and Hormone Research Foundation have sued Genentech, Inc. in a San Francisco Federal court charging the biotechnology company with infringing on a synthetic human growth hormone patent held by Hoffmann-La Roche and its subsidiary, Hormone Research Foundation, and licensed by Roche.

The suit claims that Genentech's recombinant-DNA produced human growth hormone, "Protropin," violates Hormone Research Foundation's patent on a chemically synthesized human growth hormone patented in 1974. Genentech maintains that its biotechnology product does not infringe the patent.

Hormone Research Foundation was founded by Dr. C. H. Li, a University of California at San Francisco scientist who chemically reproduced the 181 amino acids in human growth hormone in 1971. Roche licensed the process in 1982, but has not commercially developed the product.

Genentech brought "Protropin" to the market in October 1985, the first biotechnology human pharmaceutical developed and marketed exclusively by a biotechnology

firm. Genentech estimates that 1986 sales of "Protropin" will reach \$40 million. Last year, the company had revenues of \$90 million, primarily by licensing products to other companies.

A Genentech spokeswoman says Roche offered to license Dr. Li's process to Genentech, but the offer was declined. Ironically, Genentech licensed its recombinant-DNA technology for alpha-interferon to Hoffmann-La Roche in the late 1970's and Roche received Federal approval to market the product earlier this year.

A Roche spokesman says his company hopes to work with Genentech in the future, but that in this case "we've agreed to disagree and let the courts settle it."

In a separate case, Cetus Corporation sought injunctive relief and damages against Genentech in Federal district court in San Francisco, for Angen infringement of Cetus' patents covering interleukin-2 made by genetic engineering, according to Cetus.

Cetus says its action follows a request for declaratory relief which Angen filed with

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House Unit Okays Sale Of Conrail

A deeply divided House Energy & Commerce Committee narrowly approved legislation last week to sell Conrail through a public stock offering, the option preferred by most chemical shippers.

The legislation, approved on a 22-20 vote, provides for the sale of the government's 85 percent interest in Conrail, the Federally-owned Northeast railroad built from the ashes of the bankrupt Penn Central and other carriers in 1976.

The sale would be the largest public stock offering in US history and would raise a minimum of \$2 billion for the Federal government.

The Senate passed a bill in February providing for the sale of the government's interest in Conrail to Norfolk Southern Corp., but the Norfolk, Va.-based railroad holding company has since withdrawn its offer.

Chemical Manufacturers Association opposed the proposed Conrail-NS merger on the ground it would lessen competition to an unacceptable level. Such a combination would have produced the nation's largest railroad, covering 29,000 miles throughout the South, East and upper Midwest.

"Preserving Conrail's independence from another major Eastern railroad, such as through a public stock offering, at least would maintain the present degree of rail competition in the Northeast and Midwest," CMA President Robert Roland said in a letter to Congress last December.

Since Conrail serves approximately 600 of CMA's members' plants, the future of the system is of vital importance to the industry. Mr. Roland noted, adding that Conrail transports more chemical products than almost any other bulk commodity.

OSHA Slaps Fines on UCC At Two Plants

Occupational Safety & Health Administration cited Union Carbide Corporation last week for 20 alleged violations of safety regulations and recordkeeping requirements as a result of recently completed inspections at two plants.

The citations were issued at the company's specialty chemicals division plant at South Charleston, W. Va., and at its Linde division plant in West Mifflin, Pa.

OSHA cited the South Charleston plant for nine alleged "willful" violations of recordkeeping requirements and proposed penalties totaling \$90,000.

The Linde division plant was cited for one alleged willful violation of recordkeeping provisions with a proposed penalty of \$10,000. The Pennsylvania plant was also cited for seven alleged "serious" safety and health violations with proposed penalties of \$6,800.

"Adequate protection of workers requires not only emphasis on site safety but on accurate recordkeeping as well," OSHA director John Pendergrass commented on the enforcement action.

In April, OSHA charged Carbide with 221 health and safety violations at its Institute, W. Va., plant and proposed a record \$1.4 million fine. The company is appealing those charges.

The bulk of the alleged recordkeeping violations occurred at the South Charleston plant where OSHA says it found that 335 recordable injuries were not included in the agency-required annual summary from 1983 on.

The violations at the special chemicals plant, where approximately 1,000 people are employed, were grouped by injury type under nine separate willful violations with \$10,000 proposed for each.

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WASTE REDUCTION: Most experts are agreed waste reduction should receive top priority, but few resources have been committed to doing so, says the Office of Technology Assessment. Hazardous waste problems abound, according to a new OTA report, but so do opportunities for reducing industrial hazardous waste generation.

Hazardous Waste Problems Are on All Sides, Says OTA

Hazardous waste problems — ranging from contaminated sites that require million-dollar cleanup to lost drinking water supplies — are everywhere, but so are opportunities to prevent future problems by reducing the generation of industrial hazardous waste, says a new study.

Reducing the generation of waste is the most certain way to reduce risks to health and the environment from hazardous waste and it's the best way to address what many people see as a crisis, according to the report by the Congressional Office of Technology Assessment.

Most hazardous waste experts have agreed for a decade that waste reduction should receive top priority, says OTA, but few resources have been committed to doing so.

If waste reduction is the best answer, it deserves top priority and the government and industry should get serious and make it work, OTA advises.

Despite the substantial benefits of waste reduction, more than 99 percent of Federal and state environmental spending goes to controlling pollution after waste is generated.

US spending on the environment has risen

steadily over the past 14 years to about \$70 billion annually — equivalent to \$10 million a page for every one of the 7,000 pages of Federal environmental regulations and statutes, says OTA.

The attention and resources given to legally mandated pollution control activities limit the amount of thought, time, and money that industry can devote to waste reduction, says OTA.

Virtually all industries, whether high technology, smelting, or small shops, generate hazardous waste. Using a broad definition that includes wastes that threaten health and the environment and enter the air, land, and water, OTA says that more than a ton of hazardous waste is generated annually for every person in the US.

OTA points out that not all hazardous waste can be eliminated, and an effective pollution control system will always be needed. But a national commitment to waste reduction can insure that the burden of hazardous waste does not continue to grow and threaten future generations, says OTA.

Some firms in industry have already discovered that waste reduction serves their own economic interest. OTA says that the

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'Engineered Enzymes' Aid In Fats and Oils Processing

Scientists from Genencor, Inc. say that new enzymes obtained using genetic engineering techniques can result in major changes in the products formed in enzyme catalyzed reactions.

By substituting specific amino acids in a typical hydrolytic enzyme, changes from two to twelvefold in the ratio of reaction products have been achieved.

Specifically designed or engineered enzymes could be particularly useful for improving trans-esterification reactions for the conversion of inexpensive oils into more highly valued triglycerides such as those in cocoa butter.

The protease enzyme subtilisin was the enzyme modified by genetic engineering techniques for these studies. Speaking at the American Chemical Society meeting in Anaheim, Calif., Dr. David Estell of Genencor explained, amino acid replacements near the active site of the enzyme can radically alter the capability of the enzyme to catalyze trans-esterification reactions rather than hydrolysis reactions.

For example, using triacetin as a model triglyceride substrate, specifically modified

enzymes greatly altered the amount of ethyl ester versus the amount of acetic acid produced, he says.

Because other commercially useful enzymes, such as lipases and esterases have active site structures similar to subtilisin, modifications similar to those reported here could also dramatically change products formed by these enzymes.

Genencor says the work demonstrates that genetic engineering may now be used to design enzymes for specific industrial processes. Substantial improvements in substrate specificity, product control and processing economics can be attained over conventional enzymes and conventional processing methods.

The enzyme engineering technology, for which patents have already been filed, is expected to enhance the commercial development of enzymatic trans-esterification of edible fats and oils.

Further applications include improvements in triglyceride hydrolysis for the production of specific fatty acids and monoglycerides, and the synthesis of high value-added peptides, and specific fatty acid or amino acid esters.

BASF Plastics Unit Gears for Specialties

Strong growth for engineering thermoplastics in automotive, aerospace, and electronic industries, coupled with increased world capacity and maturing markets for commodity thermoplastics, has prompted BASF AG to implement a sweeping restructuring of its plastics organization in recent years.

The company has sharply trimmed vulnerable commodity thermoplastic capacity, while aggressively investing in new acquisitions and research and development in the fast-growing engineering plastics field.

Speaking at a trade press preview of Kunststoff '86 at the company's Ludwigshafen headquarters last week, BASF officials outlined the changes made and plans for the company's future in plastics, a business segment which represents over 15 percent of the company's total sales, according to Dr. Herbert Willersinn, a member of BASF's board of executive directors.

Last year, BASF plastics sales totalled 6.7 billion Deutsche marks (\$3.3 billion at current exchange rates), and a growing portion of the total is coming from advanced plastics. Dr. Willersinn says sales of these specialized resins are 8 percent to 10 percent above year-earlier levels, while commodity resin sales, with the exception of polypropylene, are up only marginally or are below 1985 totals.

The company has been busy reorganizing its commodity plastics business in the past five years, either by writing off assets, or upgrading the resin lines into specialty grades. The result, Dr. Willersinn says, is that

basic polyethylene capacity at BASF is half what it was five years ago.

At the same time, the company has gone on a shopping spree for specialty resin units, while turning scientists loose in the laboratory to develop new resin systems. Last year BASF laid out some \$420 million on investments, acquisitions and research and development.

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BASF PLASTICS: Restructuring of commodity operations has led BASF AG to put more emphasis on specialties such as advanced composite materials, ACM's are particularly applicable to high-value aerospace and aircraft applications.

Formaldehyde Makers See Flaws in Studies on Safety

Producers of formaldehyde (both formalin and paraformaldehyde) foresee no difficulties in conforming to the exposure limits of 1 or 1.5 parts per million expected to be promulgated for workers dealing with the chemical, but they are denying any correlation between exposure to the chemical and development of cancer.

At a press conference in New York last week, spokesmen for the industry emphasized the ease with which the expected maximum levels could be met. In fact, as shop managers and engineers have, over the years, responded to the irritating effect of formaldehyde on the eyes and noses of workers, most companies have gradually brought exposure limits below the expected thresholds.

Led by C.T. Howlett, director of government affairs, environment, health and chemical safety for the Formaldehyde Institute, industry spokesmen were equally emphatic

in denying the claimed link to cancer and in criticizing the logic employed in some of the studies. Dr. Donald M. Hayes, of Burlington Industries and a member of the Institute, accused one group of "fudging scientific rules to bias the results in the direction they wanted—that is, an association with cancer."

Mr. Howlett disclosed that the industry has been producing a new low-emission resin that reduces by 95 percent the formaldehyde emissions in finished products. This should make it easy for companies handling the resins to keep their exposure limits even below one part per million.

What makes the whole situation one of "straining at a gnat," another spokesman said, was the fact that the industry has virtually already met the rules which are being drawn up by no less than four government agencies: Environmental Protection Agency, Occupational Safety & Health Agency, the Consumer Products Safety Commission and

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House Okays an Overhaul Of Nation's Pesticide Law

The House voted 320-4 Friday in favor of sweeping legislation to overhaul the nation's basic pesticide law after rejecting an attempt to double the fees agricultural chemical companies would be required to pay to re-register their products.

But in doing so, the chamber invited a veto from the White House by leaving the bill \$50 million short of fully covering the cost of the Federal government's re-registration program.

Aimed primarily at strengthening public health protections, the bill to reauthorize and revise the Federal Insecticide, Fungicide & Rodenticide Act would accelerate Environmental Protection Agency's review, or re-registration of 800 pesticide chemicals that were approved for use before November

1984, but have yet to be fully tested for their health effects.

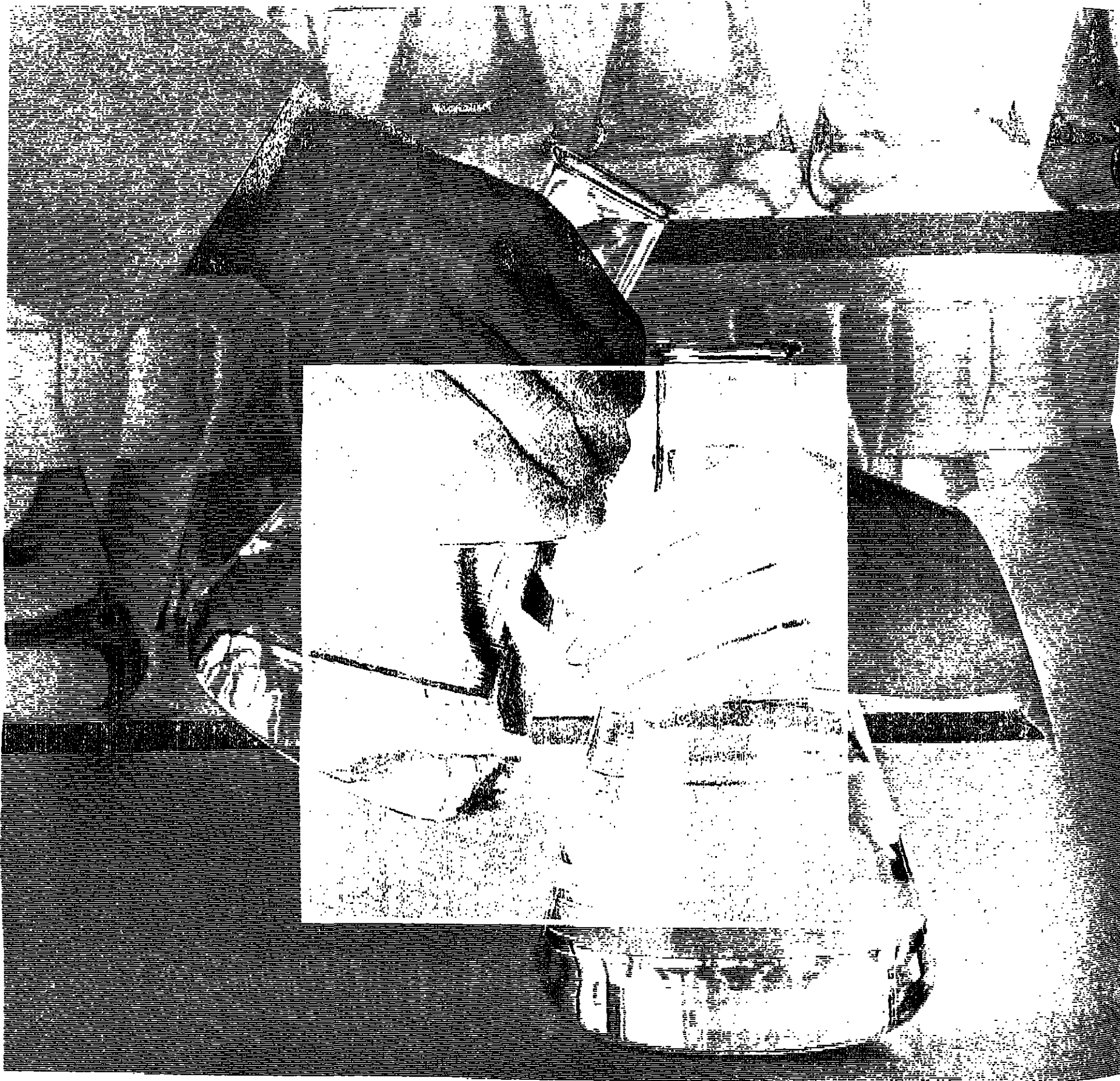
A fee of \$150,000 would be charged for the re-registration of each active ingredient, to be paid collectively by pesticide producers. Expected to produce about \$5 million per year, the fee would partially pay for EPA's re-registration effort.

EPA estimates that the nine-year program will cost \$208 million. The agency has budgeted \$110 million toward the effort, with the fees expected to bring in an additional \$45 million.

That leaves a shortfall of \$153 million — a gap the Reagan Administration believes should be filled by increased fees on pesticide producers.

In an effort to speed the House

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The Little Chemical Giant

News Capsule

Du Pont Gets Drug Unit

E.I. du Pont de Nemours & Co. has completed its acquisition of the American Critical Care unit of Baxter Travenol, Inc. (CMR, 7/14/86, p. 3). The unit has been renamed Du Pont Critical Care, Inc. and will operate as a subsidiary at its present headquarters near Waukegan, Ill.

Monsanto in Nylon Push

The fiber division of Monsanto Company will launch its new stain-resistant nylon carpet fiber during a series of three-day meetings beginning October 15 in Pensacola, Fla. About 500 major carpet retailers are expected to attend. R&D efforts on the fiber began in 1981, mill evaluations have been run since early 1985 and production quantities have already been shipped to 14 major carpet producers.

Fungicide Unit Acquired

Pennwalt Corporation has acquired a dithiocarbamate fungicide production facility in northern Spain, owned jointly by E.I. du Pont de Nemours & Co. and Enagla e Industrias Aragonenses SA. Terms of the acquisition were not disclosed. The facility will be used to supplement existing overseas production at Pennwalt Holland in Rotterdam.

Novo Opens Enzyme Plant

Novo Biochemical Industry Japan, Ltd., a wholly-owned subsidiary of Denmark's Novo Industri AS, has opened its industrial enzymes production plant at the Ishikari Bay New Port Industry Complex in Hokkaido, Japan. Completion of the plant gives Novo six enzyme production facilities: three in Denmark, one in the US and one in Switzerland.

Tax Cut Fosters Imports

A Conference Board study says tax cuts embodied in new tax-reform legislation will act to support the huge wave of imports into the US, further inhibiting any decline in the nation's \$150-billion trade deficit. The deficit is being fueled by massive real consumption which totaled \$2.4 trillion in the second quarter, up 6.5 percent from the first quarter.

P.R. Facility Opens

PCM Corporation, a subsidiary of Berwind Industries, Inc., Waukegan, Ill., has started pharmaceutical packaging operations in Humacao, Puerto Rico. The expansion follows one on the island by Key Pharmaceuticals, a major PCM customer. The new unit concentrates on blister and strip packaging, as well as bottling of solid oral capsules and tablets.

Pharmacia Wheels, Deals

Pharmacia AB and Electro-Neurochemicals Inc., Fairfield, N.J., have closed a contract for ENI to purchase US distribution rights to Pharmacia's allergy and other diagnostic lines. ENI says it will realize \$10 million to \$12 million from the transaction this year. In another agreement, Pharmacia and Allergologisk Laboratorium AS of Denmark will coordinate operations within the allergy field.

Military Boosts Plastics

High-performance plastic materials for use by the US military will boost the value of plastic parts going to the outfit over the next few years, according to a new study by Business Communications Company, Stamford, Conn. A 13 percent a year growth in value is projected to 1990.

Enzon Asks FDA Approval

Enzon, Inc., South Plainfield, N.J., has filed with Food & Drug Administration for approval to begin human trials using two of its modified enzymes — polyethylene glycol-superoxide dismutase and PEG-catalase.



David J. Phillips, who has been appointed president of Alcolac, Inc. Prior to joining Alcolac, he was general manager of the Houdry Division of Air Products & Chemicals, Inc.

Dow and Utility In Accord On Cogeneration

Dow Chemical Company and Consumers Power, Inc. reached an agreement in principle last week to jointly convert Consumers Power's idled Midland, Mich. nuclear power plant into a natural gas combined-cycle cogeneration plant.

If the agreement is carried through, the plan would end a protracted and costly legal battle the two companies have waged against each other over the problem-ridden nuclear facility.

The preliminary deal calls for Dow to become an equity partner in the project. Dow would also receive the steam and electrical needs of its giant Midland complex from the cogeneration facility.

The natural gas combine-cycle project is expected to qualify under the Federal Public Utilities Regulatory Policy Act as a cogeneration facility, the two companies said in a statement last week.

The law was enacted by Congress to encourage development of electrical generating plants that can produce both steam and electricity.

Senators Plan On Safeguards For Superfund

Sen. Frank Lautenberg (D-N.J.) Thursday said he intends to join in introducing a bill to ensure that the community right to know and other programmatic provisions of the superfund conference agreement do not get lost in a last minute congressional stall or showdown with the Reagan Administration.

Sen. Lautenberg says he would prefer to see a complete superfund package considered by Congress as soon as possible. However, the tax portion of the reauthorization bill is stalled in conference.

A staff member of the tax-writing House Ways and Means Committee says she would be "surprised" if conference find time to work on superfund before the tax reform bill is passed by Congress and sent to the White House. "Nobody has time to think about superfund," she says.

"I'm disappointed the tax conferees have not had a chance to meet," Sen. Lautenberg told reporters. "But, if we are backed up against the wall and have to choose between

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Tall Oil Is Tracking The Drop in Pine Use

Availability of crude tall oil from the US's southern mills isn't going to increase over the next five years, so producers must look to recovery processes if the industry wants to increase supply, says David Wang, senior vice-president of International Paper Company.

Speaking before the Pulp Chemical Association's thirteenth international naval stores meeting in New York last week, the IP executive predicted reduced pine elements in each of the six major product categories which add up to at least 90 percent of southern paper mill production.

The pine component will be cut in half in both bleached board and newsprint and fall from 85 percent to 60 percent in linerboard he says. Lower pine content due to substitution will impact on packaging papers, printing papers and market pulp.

As a result, Mr. Wang says an expected 2.5 to 3 percent annual growth in paper demand will be offset and will keep crude tall oil availability from southern mills at its current level of 900,000 tons per year.

"Given these structural constraints, the most promising avenue for increasing supply may reside in recovery," he says. He cites high levels of variability in CTO recovery, in terms of pounds of CTO per dry ton of pine, ranging from "the teens to the forties."

"The reasons for the variability are highly mill-specific, and improved recovery gener-

ally requires changes in operation or equipment, or both," he says.

He asserts that in his own company's mill system, an estimated 20 percent improvement in recovery is "technically feasible," but he goes on to say that it is unclear whether "adequate financial incentives exist for this increment of recovery."

David Luke 3rd chairman and chief executive officer of Westvaco Corporation, said that the key to continued viability of tall oil in a highly competitive environment is an expanding commitment to technology.

"Technology will provide an answer, but only if we recognize that merely applying technology to our processes will not be enough. In my view, we have to steadfastly maintain our commitment to process technology, while at the same time increasing manifold our commitment to technology which will support innovation and market development by aggressive new product offerings from our field," he says.

Citing competition from petroleum derivatives and agricultural oils, now coming increasingly from less-developed parts of the world which vigorously push their products onto the world market, Mr. Luke emphasizes downstream products in the tall oil industry.

"Increased technical focus on products that are derivatives of our basic commodities has been a relatively recent occurrence in the tall oil industry. The time is now at hand

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FDA Okays Patch

Food & Drug Administration has approved a low-dose estradiol skin patch that some physicians think could vastly change the way millions of women are treated for menopausal symptoms.

The patch, to be marketed by Ciba-Geigy under the brand name "Estraderm" (estradiol transdermal system) is transparent and about the size of a silver dollar. It contains 17-beta-estradiol, which is identical to estrogen produced naturally before menopause.

Small amounts of estrogen are released directly into the blood stream at a relatively constant and controlled rate, and the patch is considered the first pharmaceutical product to closely mimic a premenopausal woman's natural estrogen levels.

Most women now taking estrogen replacement therapy use estrogen pills,

while some others receive injections, and still others liquids. Delivery rate of drugs taken orally is reported difficult to control. These drugs must first pass the gastrointestinal tract before reaching the circulatory system, so a significant amount may be metabolized in the liver and never reach the rest of the body systems.

Therefore, at times high amounts of these drugs are taken to achieve proper levels in the bloodstream. This, it's noted, can cause cyclical therapeutic blood levels, which are undesirable. Injections can do the same.

However, according to Dr. Howard Judd, of UCLA's school of medicine, "the patch may avoid these problems while effectively relieving hot flashes and related menopausal symptoms," because the patch-delivered estrogen is not initially processed in the liver.

US Is Mulling New Curbs On Alachlor Corn Herbicide

Federal regulators say they are considering imposing additional restrictions on the use of alachlor to protect farmers and workers who come into direct contact with the chemical, the nation's most widely used corn and soybean herbicide.

Environmental Protection Agency began a special review of alachlor in January 1985 after test data linked the chemical with tumors in laboratory animals. Agency documents call alachlor "a probable human carcinogen."

Alachlor, sold by Monsanto Chemical Company under the trade name "Lasso," is the largest herbicide by volume used in the US. About 98 percent of its use is for controlling weeds in corn, soybeans and peanuts. First registered in 1969, about 90 million pounds are used annually in this country.

Monsanto voluntarily cancelled its use on potatoes in November 1984 and EPA has imposed a number of labeling restrictions.

One EPA official in the agency's drinking water office has recommended that an immediate "emergency suspension" of all use of alachlor be considered because traces have been found in streams and groundwater

in some intensive corn-growing areas of the Midwest, posing a potential threat to drinking water supplies.

Other agency officials, however, say a suspension is unlikely, but additional safeguards to protect applicators may be ordered.

Dr. John Moore, EPA's assistant administrator for pesticides and toxic substances, says alachlor has been found in groundwater in Nebraska and Iowa, and also has been detected in surface water in several locations from runoff, particularly in Iowa and Ohio.

But he says the available data indicate that relatively few drinking water sources have been contaminated by high concentrations of the chemical. Dr. Moore says EPA may announce a decision on alachlor as early as this week.

Monsanto says it remains confident that EPA's special review will support the continued use of alachlor. "There is absolutely no evidence that it is a human carcinogen," says a spokesman who also challenged the accuracy of EPA data indicating that alachlor has been found in high concentrations in some water supplies.

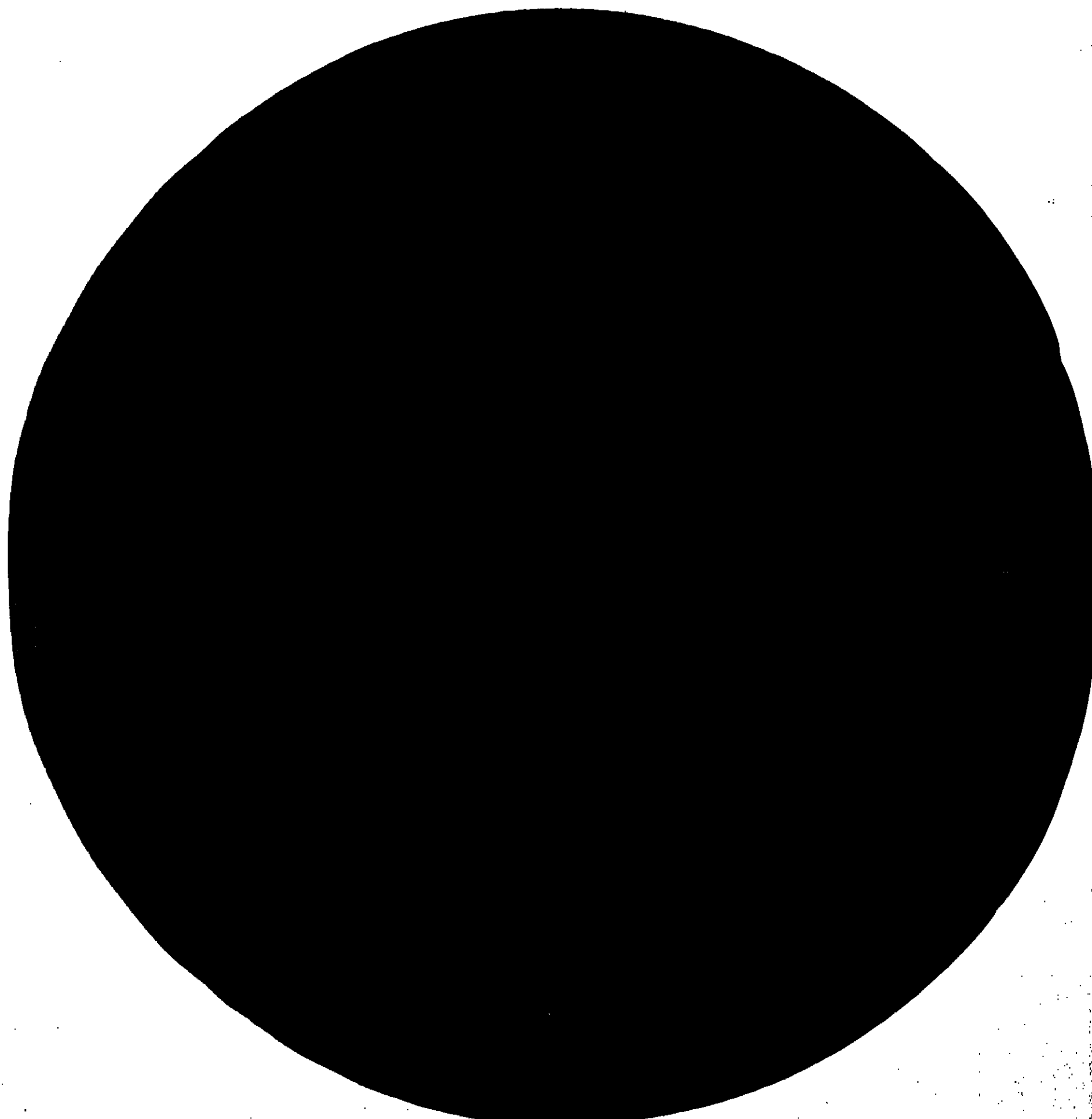
Monsanto believes "Lasso" does not pose unacceptable risks when used according to label instructions, he says.

September 22, 1986

CHEMICAL MARKETING REPORTER

9

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CHEMICAL MARKETING REPORTER September 22, 1986

OILS, FATS & WAXES

TOFA Producers Are Looking To New Specialty Applications

Tall oil fatty acid producers must concentrate more on specialty chemical markets and less on general application markets if they are to maximize their profit margins, according to Nicholas Berchtold, president of Chemical Associates, Inc.

Mr. Berchtold, speaking at the thirteenth international naval stores meeting in New York last week, sponsored by the Pulp Chemicals Association, pointed to a high level of substitutability among lower-priced competing sources of fatty acids as a main reason for stressing specialty chemical markets.

Most industrial demand for fatty acids is readily answered by material derived from vegetable oils and tallow. "The market is mixed in commodity substitutability," he says. However, markets exist for new formulations of TOFA, as well as for more established TOFA products whose properties are unique to them, he says.

The TOFA products with the lowest degree of substitutability are oleic, linoleic, dimer acids, and C-21 dibasic acid, according to Mr. Berchtold.

These account for 50 percent of the TOFA market. It is this half, he says, which holds the most promise for increased financial gains for the industry.

VALUE-ADDED CHEMICALS

"TOFA producers should concentrate on dimer acids and other specialty chemicals that are downstream products," he says. Among these other chemicals, he cites the products of esterification, a process which further reacts tall oil into a value-added ester that becomes an application-specific specialty chemical.

Ethoxylation is another process which yields specialty, generally proprietary materials. These areas are essential to a strong TOFA market, he says.

When tall oil fatty acids were first introduced in 1960, an aggressive pricing stance won the material a large share of the market, which had previously been dominated by oleic and stearic-derived fatty acids.

By 1972, production of TOFA was at a peak and the feeling in the tall oil market was that they had as much of the market share as they were going to get. Consequently, prices were brought up significantly, according to Mr. Berchtold.

In the next couple of years, oleic became a better buy than TOFA, and the tall oil industry lost some of its business. By 1978, TOFA prices were forced to come down.

As energy costs rose in 1984, so did the

floor of crude tall oil prices, due to its value as an alternate fuel. This in turn led fractionators to push for higher pricing on TOFA, Mr. Berchtold says.

This was followed by the slide in prices that continues to this day. "Just as in 1978, we have excess crude tall oil and excess tall oil fatty acids — the markets for these products are not there," says Mr. Berchtold.

"In order for TOFA to recover, history must repeat itself, and tall oil fatty acids must reach parity with soybean oil," he says.

It was in the late 1970's that TOFA producers, looking for firmer markets to get into, found success with dimer acids and oleic and

PRICES TRENDLINES

WEEK ENDING SEPT. 19, 1986

CHANGES/UP

Coconut oil, NY, 1/4c. per lb.
Corn oil, Midwest, 1c. per lb.
Cottonseed oil, Valley, 1/4c. per lb.
Grease, white, choice, tanks, divd., NY, 1/4c. per lb.
Lard, loose, bulk tanks, Chicago divd., 1c. per lb.
Tallow, inedible, fancy, tanks, divd., NY, 1/4c. per lb.
Tallow inedible, bleach., tanks, divd., NY, 1/4c. per lb.

CHANGES/DOWN

Peanut, 50% bulk, SE, per ton \$5.
Peanut oil, Southeast (restricted), 1c. per lb.
Soybean, 44% bulk, Decatur, \$17 per ton
Soybean oil, Decatur, 4 1/2c. per lb.

OILS, FATS INDEX

The Oils, Fats & Waxes Index reflects the prices of 11 representative materials in this sector and the quantity of each produced in 1985.

Sept. 19, 1986 78.47
Sept. 12, 1986 83.70
Aug. 22, 1986 85.51
Sept. 20, 1985 84.07

Chemical Prices Start on Page 52

lin-oleic materials. Just as before, TOFA producers must explore new opportunities for materials that only they can provide, according to Mr. Berchtold.

"The TOFA market will continue to experience competition from soybean oil, sunflower oil, tallow, and now, low erucic acid rapeseed oil from Canada," he says.

To contend with this competitive environment, Mr. Berchtold says, "producers must selectively maintain" those markets that are valuable and unique to them.

VEGETABLE OILS

CASTOR OIL — The price on this oil is being quoted at 31c. and 31 1/2c. per pound, raw, No. 1, Brazilian tanks. The fall in price is attributed to ample stocks and the absence of an expected increase in demand.

"We expected a pick up in demand after Labor Day, but it never came," says a source, who goes on to say that suppliers will lower their prices and the market will continue to weaken until supplies work their way down.

It is expected that India will not be selling castor oil on the world market next year, making Brazil the sole world supplier.

India, which has traditionally been the number two exporter of the oil, has experienced considerably increased consumption, and is expected to stay out of the US market, as they did this year, as well as the European market, to which they have been selling castor oil this year.

SOYBEAN OIL — Strong export demand this month has brought about a very tight supply situation, industry sources say. Contributing to the shortness in supply is downtime by both processors and refiners, due to maintenance projects, as well as occasional shortages of beans.

"The market is as tight now as it has been for six or seven months," says a source. He cites downtime as a main contributor, but

FRIDAY SPOT PRICES

MARKET CLOSE SEPT. 19, 1986

CRUDE VEGETABLE OILS

Coconut oil, NY lb. .19 1/4
Corn oil, Pacific lb. .17
Corn oil, Midwest lb. .17
Cottonseed oil, Valley lb. .14 1/4
Lined oil, Minneapolis lb. .28
Palm oil, NY lb. .11 1/4
Peanut oil, Southeast (restricted) lb. .28
Soybean oil, Decatur lb. .1530

REFD. VEGETABLE OILS

Coconut oil, LW, NY lb. .19
Corn, Jimbo tanks lb. .2370
Cottonseed oil, Jimbo tanks, NY lb. .2378
Peanut oil, Jimbo tanks, NY lb. .3980
Soybean oil, NY lb. .1983

OILMEALS

Cottonseed, 14% bulk, Memphis ton \$125
Lined, extracted, 34% bulk, Fargo ton \$95
Peanut, 50% bulk, SE, Alabama ton \$190
Soybean, unroast, 44% bulk, Decatur ton \$188

FATS & GREASES

Grease, white, choice, tanks, divd., NY, 1/4c. per lb.
Grease, yellow maximum 10%, 1/4c. tanks, 1/4c. per lb.
Lard, loose, bulk tanks, divd., Chicago lb. .14
Tallow, inedible, fancy, tanks, divd., NY, 1/4c. per lb.
Tallow, inedible, bleach., tanks, divd., NY, 1/4c. per lb.

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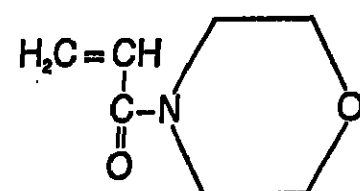
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Chemical Finance

American Home Buying Chesebrough Business

American Home Products Corporation, New York, has signed a definitive agreement to purchase the Hospital Products Division of Chesebrough-Pond's Inc. for \$260 million. Products include nutritional feeding and cardiopulmonary devices, thermometers, continence control products, treatments for wounds and various personal care items.

Cyanotech Shares Are Listed on NASDAQ

Trading has begun in the shares of Cyanotech Corporation on the automated quotation system of NASDAQ, which has become the nation's second largest and fastest growing securities market.

Dow, Great Lakes Boosts Dividends

Dow Chemical Company and Great Lakes Chemical Corporation have announced dividend increases on their common stocks. Dow's new dividend is 50 cents per share, 6 cents, and payable October 30 to holders on September 30. Great Lakes' dividend is 14 cents per share, payable October 28 to holders on October 1.

Vega Biotechnologies' Results Improve

Vega Biotechnologies Incorporated, Tucson, Ariz., improved its results markedly in the first fiscal quarter ended July 31. Sales were up 65 percent to \$1,040,000 from \$634,000 a year earlier, and the net loss decreased 60 percent to \$156,000 from \$292,000. Research for E.I. DuPont de Nemours & Co. accounted for \$219,000 of the increase in revenue and is expected to continue at that level throughout the remainder of the fiscal year.

ImmunoGenetics Divests Unit, Plans Acquisition

ImmunoGenetics, Inc., Vineland, N.J., has sold its "Surge-Cream" line of skin products to American International Industries, Hollywood, Calif., for \$2.75 million in cash and secured notes. Meanwhile, ImmunoGenetics continues negotiations to acquire privately held pharmaceutical company that holds rights to some 60 ethical and dermatological preparations for humans and animals.

Montedison's Iniziativa Has Profit Increase

Iniziativa ME T.A., the services sector of the Montedison Group, raised its net profit in the first half of 1986 to the equivalent of \$17.2 million from \$17.1 million a year earlier. Dividends from companies in which Iniziativa ME T.A. holds an equity position declined to \$11.9 million from \$16.9 million a year earlier, reflecting a divestment.

Pantasote to Repurchase 1.6 Million Shares of Stock

Pantasote Inc., Greenwich, Conn., has entered into an agreement to repurchase 1.6 million shares of its common stock from the Wyman family for an aggregate price of \$10 per share, totaling \$12.8 million, in cash, plus shares of convertible preferred stock with an aggregate liquidation value of \$3.2 million and a cumulative dividend of 8 percent per year.

Research-Cottrell Declares Dividend

Directors of Research-Cottrell Inc., a diversified engineering company based in Somerville, N.J., have declared a dividend of 8 cents per pound on the capital stock.

Shell Transport Raises Dividend 8 Percent

Directors of Shell Transport & Trading Company PLC, London, England, have declared an interim dividend of 54 pence per New York share (one New York share equals four ordinary shares), an increase of 8 percent over 50 pence a year earlier, payable November 17 to holders on October 2. The amount to be paid to holders in US currency will depend upon the exchange rate on November 6. At the current rate of \$1.44 to the pound, the dividend would be \$1.15 per share.

Imperial Adhesives Acquires S-W Business

Imperial Adhesives, Inc., Cincinnati, Ohio, has acquired the industrial adhesive business of Sherwin-Williams Company, including customer lists, formulas and related technology, effective September 1.

Standard Oil to Issue \$150 Million of Notes

Standard Oil Company, Cleveland, Ohio, has agreed to issue \$150 million of 7-year non-callable, 7-year notes through Salomon Brothers Incorporated, under an equity shelf registration. The notes will be issued at 100 percent, and proceeds will be used for general corporate purposes.

Syntex Sells Dental Business to New Company

Syntex Corporation, Palo Alto, Calif., has signed a contract for the sale of its dental products business, Syntex Dental Products Inc., to a newly formed company, Dentex Dental Products Corporation, controlled by Raymond G. Perelman, Mr. Perelman's private investor with interests in a number of manufacturing businesses, including Chaves Virginia Inc., a dental equipment manufacturer. The sale is expected to be consummated in late October.

Alcoa to Redeem Outstanding 13% Pct. Debentures

Aluminum Company of America will redeem all of its outstanding 13% sinking fund debentures due 2011 at a price of 110.448 percent of the principal amount plus accrued interest to October 17, 1986. The bonds may be redeemed at Alcoa's Company of New York and or Pittsburgh National Bank.

Eli Lilly Applies for Tokyo Stock Listing

Eli Lilly & Co., Indianapolis, Ind., has applied to list its common stock on the Tokyo Stock Exchange. Nikko Securities Company is sponsoring the listing, which is to be effective in the fourth quarter. Lilly entered the Japanese market in 1984 through that country through several subsidiaries and joint ventures.

IMS International Declares Dividend of 3 Cents

IMS International Inc., New York-based multinational provider of health and personal care services, including market research, medical publications, operations and toxicological testing, said its board of directors has declared a 3-cent dividend on the company's common stock, payable September 30 to September 12.

AROMATICS

Continued from Page 13

has slackened a bit since the first half of the year, and are concerned about growth prospects for next year.

It is believed that the new tax structure, if implemented, will reduce the incentive for commercial construction, and could lead to a flat rate of growth in 1987.

Further complicating the picture in 1987 will be the debottlenecking of BASF Wyandotte Corporation's Geismar, La. plant, from 100 million to 155 million pounds per year.

The company says it expects to be operating at the higher capacity by mid-1987. Spokesmen note that when the plant came on stream earlier in the decade, much of the equipment necessary to operate at 155 million pounds per year was already in place.

The company says that, while some equipment modifications may be needed before the plant can begin operating at the higher rate, the mid-1987 target date represents not the length of time required to make the

change but rather the company's schedule at present.

An earlier date for the startup of the additional capacity is not ruled out, and some industry sources say they expect it to happen closer to the first of the year.

Producers note that a portion of BASF's additional product will likely be used to supply the parent company in Germany. "They have had some problems over there with downtime, and the market is quite active," comments one producer.

It is observed that export demand for MDI is fairly strong, and operating difficulties in Europe have contributed to making the market fairly tight worldwide. US product is said to be moving primarily to Canada, Mexico, South America, and the Far East.

PTHALIC ANHYDRIDE — Koppers Company, Inc. and USS Chemicals say they are raising prices for the fourth quarter. Effective October 1, Koppers is moving up 1c. per pound on selling prices, and USS Chemicals is reducing all competitive allowances on molten and flake material by 2c. per pound.

USS Chemicals attributes the change to rising feedstock costs and "the need to restore an equitable return to the product." A week earlier, BASF Wyandotte Corporation and Stepan Company announced 1c. per pound price increases on molten and flake material for October 1.

Olin, Du Pont Boost

Continued from Page 3

Pont says. Electron beam imaging systems account for 50 percent of photomask production costs, the company adds.

Semiconductor producers spend about \$1 billion a year on photomask product, Du Pont says, and it projects that the market will grow at over 20 percent a year for the next ten years.

Olin says its new joint venture will be called Olin-Asahi Interconnect Technologies. US sales will be handled by Olin Interconnect Technologies, based in Stratford, Conn.

Olin says the joint venture is part of the company's strategy "to be a major worldwide supplier of electronic materials and services." The company already produces photoresists for microelectronics markets, and supplies acids, solvents, and dopants to the electronics industry. Its Olin Brass unit also supplies copper alloys and clad metals to the industry. Asahi Glass is a long-time producer of ceramics in Japan.

SECOND PARTNERSHIP

Olin-Asahi Interconnect marks the second partnership between the two firms. In 1974 the two joined to build and operate a urethane polyol chemical plant in Japan, and the business has evolved to a \$100 million a year operation.

"The ceramics venture is another building block for our interconnect technology business, and we intend to expand our role in that arena," said Olin senior vice-president Thomas J. Berardinol. It is the intention of the joint venture to establish a fully integrated ceramics manufacturing capability in the United States," he said.

The venture gives Olin an immediate entry to the electronics ceramics market. Until a plant is built in the US, the joint venture's products will be made in Japan and custom finished in Connecticut.

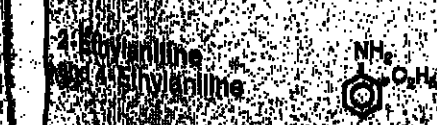
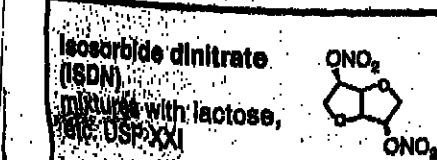
Olin says the Japanese plant makes ceramic substrates. The Stratford, Conn. facility will be able to supply standard, custom, and laser finished ceramic substrates, the company adds.

At present there is no US-based supplier of ceramic interconnect systems, according to Olin. The company has several units in the interconnect field, including Mesa Technology, Mountain View, Calif., a maker of tape automated bonding materials; and Indy Electronics, Manica, Calif., Irvine, Scotland, the largest independent contract assembler of integrated circuits in the US and Europe. Olin owns a large stake in Indy Electronics.

Du Pont's new electronics department establishes a business unit with combined worldwide sales in the electronics industry of \$1.3 billion. The group makes electronic materials, components, and storage products, and is currently the fourth largest US electronics firm.

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Hazardous Material Accidents To Be Countered by Computer

The chemical industry last week unveiled a computerized information system to help fire departments and other emergency services respond to accidents involving hazardous materials.

The system, called "HIT" — Hazard Information Transmission — was developed for the industry's fifteen-year-old Chemical Transportation Emergency Center (Chemtree).

Chemtree is a 24-hour emergency hotline service. According to Chemical Manufacturers Association, it gives firefighters, hazards and appropriate actions to take to deal with fires, spills or leaks of the products. The HIT system was designed to speed access to the information maintained by Chemtree.

The heart of the HIT system is a computer

program developed for the CMA by AT&T. Information on more than 1,700 common chemicals — generally chemicals produced and shipped in large quantities in the United States — has been put into the system. Eventually, data on more than 4,000 chemicals will be maintained in the system, CMA says.

The system gives emergency service personnel at the scene of an accident a hard-copy printout of the information maintained by Chemtree. Until now, communication between Chemtree and personnel at the scene of an accident has been oral, via telephone.

CMA president Robert A. Roland says the new computer link between Chemtree and emergency services around the country "allows information to be relayed much more quickly and accurately. In addition, we can relay more information."

The system has been tested in six areas: Chicago; Jacksonville, Fla.; Fort Collins, Colo.; Fullerton and Corona, Calif.; and Prince George's County, Md.

Mr. Roland says the industry is establishing Chemtree 15 years ago "to give quick, accurate information to emergency service personnel. And that desire has not changed," he says.

Although Chemtree was originally established to assist in transportation incidents, last year Chemtree's services were expanded to provide information for non-transportation emergencies as well. Chemtree is located in CMA's headquarters in Washington.

Chemtree is one of four programs that make up the industry-funded National Chemical Response and Information Center, which was established in early 1985.

The other elements of the NCRIC are: The Chemical Referral Center, the center through a toll-free number, 800-363-4200, to source for non-emergency information on chemicals and their hazards. The center, which began operation in December 1984, has responded to more than 6,700 requests for information.

Chemnet. This nationwide, mutual-aid system is made up of 213 emergency response teams: 163 are chemical industry teams, 50 are private contractor teams. The teams are available to provide technical assistance at the scene of transportation accidents.

The Chemical Referral Center and Chemnet both have emergency response training programs.

Ceramics, Polymers

Continued from Page 4

trast, Japan, in particular, has aggressive government-industry programs to commercialize its evolving materials technology.

Ceramics encompass a broad class of materials that are most conveniently defined by what they are not — they are neither metallic nor organic. Compared with metals, ceramics generally have superior wear resistance, high temperature strength, chemical stability, low electrical and thermal conductivity, and lower toughness.

Most advanced ceramics are made by heating and compressing finely divided oxides or nonoxide powders at high temperatures.

Polymer matrix composites are organic polymers which have been reinforced with fibers to provide added strength and stiffness. This category includes reinforced plastics (which have been used for 40 years in boat hulls, automotive panels, and sporting goods) and advanced composites, which are primarily used in the aerospace industry.

Their chief advantages are their strength along the direction of reinforcement, low weight, high stiffness, and corrosion resistance. They cannot yet be used at temperatures above 600 degrees Fahrenheit (316 degrees Celsius).

Before new structural materials can be widely used, a number of preconditions must be satisfied: First, designers accustomed to metals must become comfortable with new materials. Second, new methods of design and manufacture must be developed.

ALIPHATIC ORGANICS

Linear Olefins

Continued from Page 3

density polyethylene is expected to reach 34 billion pounds, this year, 1990 demand will rise modestly to 35 billion pounds according to industry forecasts.

However, continued inroads made by LDPE into LDPE will bring linear material up from its current 20 percent share of the demand to a 30 percent share of the requirement by 1990.

"New LDPE plants being built around the world and higher operating rates at existing plants will spur strong growth through 1990," says one US marketer.

Demand growth, as strong as it is, has been moderated by the cost of LDPE plants, says the marketer. Polymer producers will maximize their use of blends in order to minimize costs while taking advantage of the properties offered by the linear polymer.

While linear olefins demand growth due to increased LDPE requirements will affect C₂ through C₆ olefins, C₇ through C₁₀ cuts, used primarily in detergent applications, should see growth only in the 2 to 3 percent range.

Producers have been looking to underdeveloped nations to expand their use of detergents based on olefin raw materials. However, growth has so far been stemmed by the high cost of olefin-based facilities.

In the US, strong demand for linear olefins has aided prices. First quarter price increases of 2 1/2 cents per pound on average have been successful, according to sources.

Current list prices are 28 1/2 cents per pound for C₄ material and 40 cents to 46 1/2 cents per pound for C₅ through C₁₀ materials. Multiple cuts of higher than C₅ material are list priced between 30 cents and 40 cents per pound.

ACRYLATES — Rohm and Haas says it will raise selling prices on acrylic acid, (glacial and flocculant grade), n-butyl acrylate and ethyl acrylate by 3c. per pound on October 1.

New selling prices, according to the company will be: 49.5c. per pound for n-butyl acrylate, 47.5c. per pound for ethyl acrylate, 49c. per pound for glacial acrylic acid and 51.3c. per pound for flocculant grade acrylic acid.

All prices are f.o.b. plant and minimum freight allowed.

BRAKE FLUIDS — ICI Americas says it will increase all brake fluid prices by 25c. per gallon on October 1. "The price increase is the result of increasing value and decreasing availability of ethylene glycol ethers, the major raw material used in brake fluids," according to ICI.

This follows a similar move made by Dow Chemical last week.

ETHYLENE OXIDE — ICI Americas Inc. says that it will increase the price of ethylene oxide, ethylene glycol industrial grade, diethylene glycol and triethylene glycol by 2c.

PRICES TRENDLINES

WEEK ENDING SEPT. 19, 1986

CHANGES/UP

None

CHANGES/DOWN

None

ALIPHATICS INDEX

The Aliphatic Organics Index reflects the prices of 20 representative materials in this sector and the quantity of each produced in 1985.

Sept. 19, 1986 222.80
Sept. 12, 1986 222.80
Aug. 22, 1986 222.80
Sept. 20, 1985 203.80

Chemical Prices Start on Page 52

per pound on October 1. This follows Dow's announcement last week saying it will raise prices on its EO derivatives by 2c. per pound. Dow however decided not to move its diethylene glycol pricing from current levels.

ICI says that supplies of ethylene glycol are limited due to high operating rates for ethylene oxide. With demand of 5.8 billion pounds per year for ethylene oxide in the US being served by an operating capacity of 6.5 billion pounds, output is currently running at 90 percent of capacity. Michael Chadwick, business director for ICI Petrochemicals says that ethylene oxide production has traditionally operated below 90 percent. "Ethylene oxide is rapidly approaching the state of balance which will alter the characteristics of the market," according to Mr. Chadwick.

OXO ALCOHOLS — Major producers of oxo alcohols have announced price increases of 2c. per pound, not to exceed current list values, effective October 1.

The only companies to change list levels are Tenn-US which makes only the 2-EH oxo-alcohol and Celanese which makes only the butanols. Tenn-US will increase its 2-EH list level from 32c. to 34c. per pound on October 1 and Celanese will revise its list prices to 31c. per pound for n-butanol and 28c. per pound for iso-butanol.

ALIPHATIC ORGANIC EXPORTS: JULY

BUREAU OF CENSUS FIGURES IN POUNDS ON THE KEY ALIPHATICS

	JULY		JUNE	
	QUANTITY	\$ VALUE	QUANTITY	\$ VALUE
Acetic Acid.....	24,028,104	2,755,556	6,424,080	695,632
Acetone.....	10,597,828	2,335,949	3,069,812	954,110
Acrylonitrile.....	62,158,004	1,400,183	98,820,388	25,323,369
Adipic Acid.....	5,492,197	2,239,524	5,752,511	2,546,662
Butadiene.....	15,087,019	2,251,332	21,320,000	4,395,267
Butanol.....	17,730,391	3,705,007	8,125,775	1,544,571
Butyl Acetate.....	7,596,328	1,944,307	3,875,220	1,041,182
Caprolactam.....	1,824,961	784,481	1,379,997	748,876
Chlorinated Hydrocarbons.....	5,032,899	1,651,105	9,191,288	1,755,481
Ethyl Acrylate.....	10,181,032	2,740,344	16,143,858	3,287,809
Ethyl Alcohol.....	7,208,574	2,706,389	6,194,713	2,404,542
Ethylene Glycol.....	441,355	854,805	63,677	106,235
Ethylene Dichloride.....	55,878,794	5,834,298	15,898,513	603,547
Formaldehyde.....	38,016,601	6,149,831	44,907,261	7,421,672
Glycerine (Crude).....	1,028,480	133,748	1,805,517	209,525
Glycerine (Refined).....	1,034,802	78,023	391,418	155,225
Hexanol.....	8,072,655	5,294,472	3,154,289	1,940,195
Methanol.....	4,924,198	1,845,018	3,592,958	1,371,277
Methyl Ethyl Ketone.....	6,338,410	1,879,443	7,440,451	1,774,549
Methyl Methacrylate.....	5,885,402	3,256,369	6,306,106	2,512,121
Perfluoropolyethylene.....	12,257,493	2,162,217	2,554,322	555,008
Polyethylene Glycol.....	2,584,252	235,821	1,971,053	346,995
Polypropylene Glycol.....	895,254	880,781	890,183	414,535
Propyl Alcohol.....	14,343,093	5,807,067	15,051,947	1,591,957
Propylene Glycol.....	15,408,802	2,856,284	208,559,046	1,520,595
Propylene Oxide.....	11,152,555	3,892,051	6,325,958	1,775,209
Thiodiethylene Glycol.....	6,102,872	2,704,827	4,713,072	1,764,208
Vinyl Acetate.....	7,875,764	2,002,235	1,827,662	409,589
Vinyl Chloride.....	55,147,858	12,431,287	35,795,020	6,879,051
Vinyl Chloride.....	180,898,344	25,833,808	65,065,751	10,464,545

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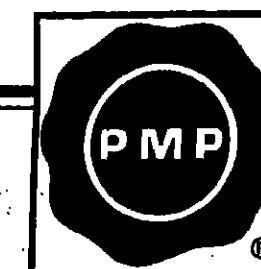
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Hazardous Waste

Continued from Page 7

challenge is to persuade and assist more American companies to follow their lead. For example, 3M has saved almost \$300 million since 1975 with its waste reduction efforts.

Some European countries are a decade ahead of the US in implementing waste reduction to improve industrial efficiency and international competitiveness, according to OTA.

By reducing waste, says OTA, industry uses materials more efficiently; lowers waste management, regulatory compliance, and future cleanup costs; reduces uncertain but potentially large civil and criminal liabilities; and promotes modernization and innovation.

Current pollution control and waste treatment methods often do little more than move waste around, and many hazardous wastes, such as most toxic air emissions, are not yet regulated, says OTA. In the face of increas-

ing regulation, says OTA, reducing waste generated can help drive down pollution control spending for individual companies and the nation as a whole.

OTA reports that technology itself is hampering the way to serious waste reduction opportunities are in every part of industrial production — but seldom are planted, and often not even recognized.

The trick, says OTA, is to get all products workers and industrial managers to think waste reduction routinely in their everyday activities.

According to OTA, corporate determination and commitment are the critical factors. Hardware can always be improved, but is not the most important issue.

OTA finds no common definition of waste reduction. Few or no data on the extent of industrial waste reduction; and information collected by government on waste generation useless for the purposes of measuring waste reduction.

If the definition of waste reduction is lumped together with waste treatment, say OTA, companies will naturally pay more attention to treatment, a familiar activity, than to reduction of waste.

OTA points out that no matter how waste is managed, the generator may be subject to liabilities. Even sending hazardous waste to recycling or treatment facilities poses unavoidable risks; transportation accidents; human and technological failures; and already created superfund sites that require expensive cleanup.

According to OTA, there are five approaches to waste reduction: change materials; change production technology and equipment; improve production operations and procedures; recycle potential waste as part of production; or redesign or reformulate end-products so less waste is generated.

SUBSTANTIAL IMPACT

OTA says it would be impractical for the government to attempt a traditional regulatory approach to promote serious waste reduction. The impact of prescriptive regulations on troubled manufacturing industries could be substantial, the report notes.

However, says OTA, regulatory action may be necessary eventually if voluntary private sector efforts now beginning are successful.

An alternative is a course based on government leadership and assistance, just as some States and foreign countries have followed, to spur rather than require waste reduction.

According to OTA, several possible Congressional actions are particularly attractive if Congress and the Administration choose to affirm a national goal of perhaps rapid and comprehensive hazardous waste reduction.

- Create an Office of Waste Reduction with an assistant administrator within the Environmental Protection Agency.

- Create a grants program to develop generic or widely transferrable technical support for waste reduction in production processes.

- Through new comprehensive waste reduction legislation, require detailed reporting by industry on past waste reduction actions and plans for future efforts, clarify national policy on the primacy of waste reduction over pollution control strategies, define waste reduction and the range of waste to which it applies, and possibly set a national voluntary goal of perhaps as much as 10 percent hazardous waste reduction annually for the next five years.

The goal would not be a regulatory requirement, but a way to stimulate waste reduction.

As examples, OTA notes that from 1984 to 1985, Rohm and Haas and Exxon Chemical Americas each reduced their hazardous waste generation 10 percent, and two divisions of E.I. du Pont de Nemours & Co. reported 50 percent and 38 percent reductions.

Zirconia Unit Sold

Z-Tech Corporation has acquired the assets of the zirconia operation of Ferro Corporation located in Bow, N.H. Z-Tech Corporation is a wholly-owned US subsidiary of Z-Tech Australia Limited. Z-Tech will continue to produce the same products at the same location with the same staff.

Tall Oil Tracking

Continued from Page 9

when our product lines need to be reinforced by increasingly advanced derivatives," he says.

Opportunities exist for tall oil products producers who are willing to break from their status as commodity manufacturers and move increasingly into the specialty chemicals field, Mr. Luke says.

Paper size, for instance, is a product field that provides "opportunity for substantial further improvement," he says. Also, ink makers want new resins which are compatible with steadily higher press running

speeds being used today.

Gerry Highberger, president of the ink consulting firm Weber & Permut, Inc., says that the naval stores industry, particularly rosins, will maintain their share of the ink market over the next few years.

Rosin's chief competitor in the ink market, hydrocarbon-based resins, are no longer a growing threat, according to Mr. Highberger. "Hydrocarbons have reached their limit, based on performance properties," he says.

Pointing to the lower pricing of hydrocarbons, Mr. Highberger says that they have replaced rosins completely in non-heat web offset ink production, and by half in heat-set offset inks.

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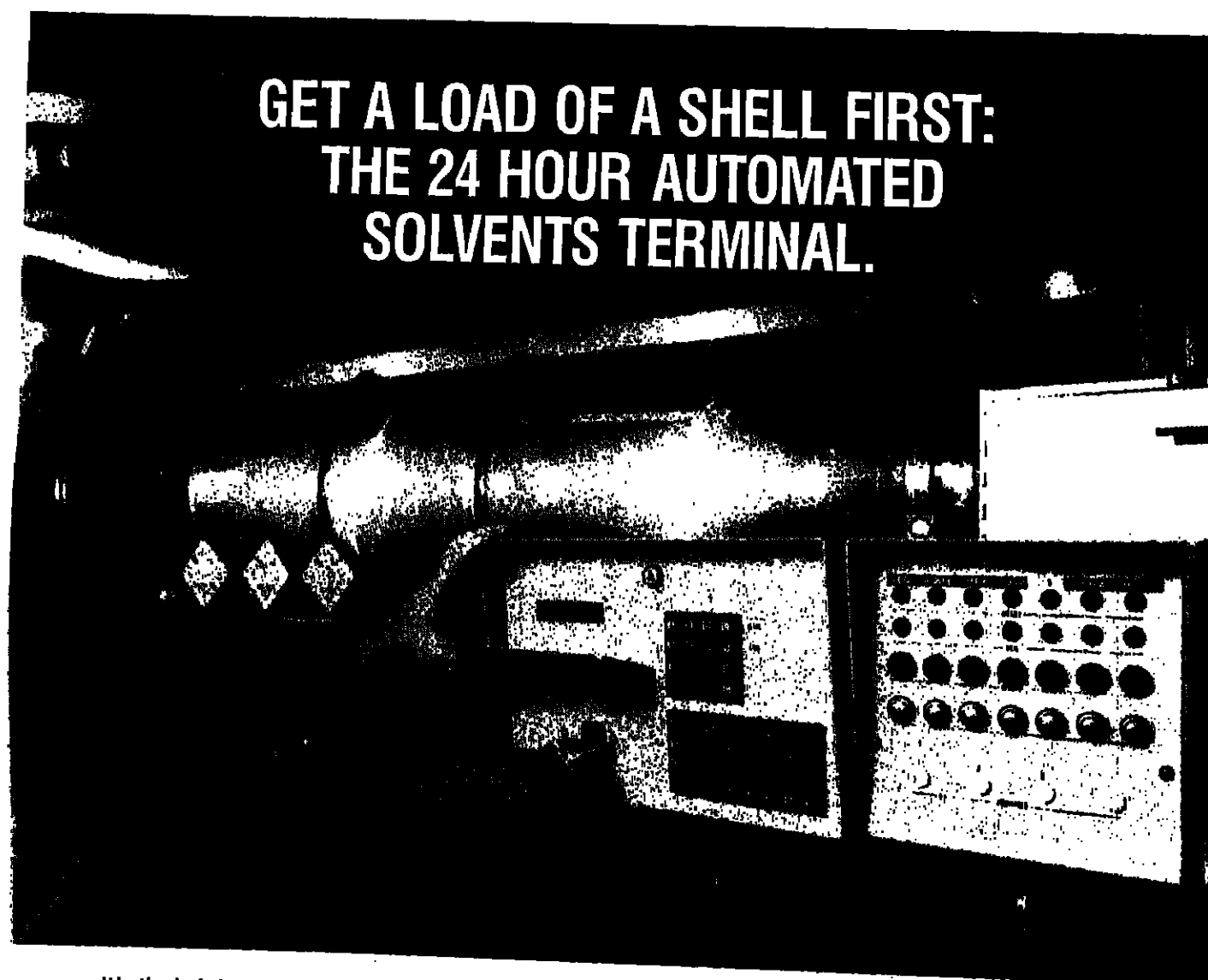


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DRUGS & FINE CHEMICALS

Sulfamethazine Demand Slumping Amid Growing Residue Concern

Sulfamethazine depression continues to deepen, and few observers are optimistic that the situation will change soon.

Sulfamethazine's cost has eroded for about two years, but most sources believe the price has bottomed out between \$9 and \$10 per kilogram. About two years ago, the price was between \$12.00 and \$12.50 per kilogram.

During the past year, a decrease in demand had caused an oversupply, helping drive down pricing. Now, because of oversupply, companies are existing off inventory, and less material is being imported.

January through July import figures show a 35 percent drop in imports, compared to the same period in 1985. About 955,000 pounds have come to the US through July, compared to about 1.5 million pounds through July 1985.

Almost all exporters to the US have sent substantially less this year. Yugoslavia, the largest exporter, has sent 27 percent less sulfamethazine here through July.

China's total has dropped by 56 percent, Germany's by 47 percent, and Hungary's by 26 percent.

DENMARK INCREASES EXPORTS

Only Denmark has increased its exports this year, sending 11 percent more. One source says this is because the Danish material is especially suitable for veterinary purposes, such as horse pills. This segment, although minor, is not shrinking, according to the source.

Sulfamethazine's major use, however, as a feed additive in swine and cattle feeds, is shrinking. Some observers cite the popularity of poultry and fish, but most admit that concern about residue is the main factor.

Residue problems have been talked about for years, but sources say that recently the concern has grown, partly because of increased media exposure, which one source terms "sensational." Farmers should not slaughter an animal until 10 to 15 days after it has consumed sulfamethazine, say observers, because if the slaughtering is done in advance, there is often a sulfamethazine residue, which causes allergic reactions in some people.

A Food & Drug Administration spokesman says that because some people react to the residue, "we can't take chances." The legal limit of allowed residue is 0.1 part per million.

Carcasses are routinely examined, and those with high residue levels are discarded. The spokesman says that, generally, samples of the carcass are taken, and the rest of the carcass is allowed to continue being processed. If the sample has high residue levels, the rest of the carcass is recalled.

Sulfamethazine sources say they are

equally concerned about residue problems, but do have some complaints. One source, for example, insists that "the government has residue levels at (a) ridiculous rate." Another source says that, because of publicity, the residue problem is "becoming a political, not a scientific issue."

He further notes that "the FDA is under a

PRICES TRENDLINES

WEEK ENDING SEPT. 19, 1986

CHANGES/UP

None

CHANGES/DOWN

None

DRUGS INDEX

The Drugs & Fine Chemicals index reflects the prices of 10 representative materials in this sector and the quantity of each produced in 1985.

Sept. 19, 1986 211.16
Sept. 12, 1986 211.16
Aug. 22, 1986 211.16
Sept. 20, 1985 211.16

Chemical Prices Start on Page 52

lot of pressure," mainly from consumer groups. Many observers comment that the problem is not getting worse, but detection methods are becoming increasingly sensitive. Therefore, more carcasses are being found unacceptable.

To help the situation, the sulfamethazine is often encapsulated, which one source says helps the product's flowability through the system.

Some sources say there is another market condition serving to decrease their already faltering business. They maintain that some sellers are able to get sulfamethazine on the US market without receiving FDA approval.

"The FDA has difficulty in checking everyone," says a purchaser. "There is a misuse of unapproved sulfamethazine." Others claim to hear rumors to the same effect, and express the hopes that offenders will eventually be caught and penalized.

Animal Health Institute has released 1985 feed additive sales figures. In 1985, sales totaled \$270.9 million, down from 1984's revised figure of \$283.1 million (revised from the original total of \$292.4 million). These totals are for anti-bacterial feed additives. Overall feed additive sales are also said to be down slightly.

BUTYLATED HYDROXYANISOLE — Attempts to change Japan's policies concern-

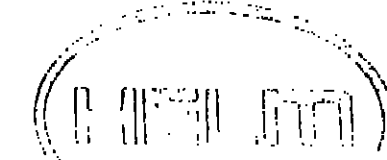
DRUG & FINE CHEMICAL EXPORTS: JULY

BUREAU OF CENSUS FIGURES ON THE KEY DRUGS.

	JULY	JUNE
	QUANTITY	VALUE
Antibiotics:		
Ampicillin and salts, bulk	28,729	1,288,722
Erythromycin	24,498	2,818,868
Penicillin GSKF	1,425,383	3,787,087
Penicillin G salts, bulk	15,829,892	1,870,053
Tetracycline	166,149	3,751,029
Aspirin	1,278	1,802,854
Caffeine and deriv.	234,308	437,388
Citric acid	9,400	41,480
Optical alcohols and deriv.	913,887	1,043,812
Homocysteine	548	27,917
Corticosteroids, napi	4,886	4,825,818
Nonsteroid hormones	10,681	2,853,820
Prednisolone and salts	1,839	2,783,103
Glucocorticoid hormones and synthet	10,192	2,342,235
Sulfonamides, bulk	76,846	1,017,814
Vitamins:		
Ascorbic Acid	181,828	733,718
Vitamin A and Pro-Vitamin A, bulk	108,949	810,868
Vitamin B ₆ (thiamine)	1,348	6,830
Vitamin B ₁₂	1,401	13,834
D and D ₂ panthothenic acid	64,343	863,010
Niacin and niacinamide	2,848	22,886
Vitamin, napi	221,418	1,411,527

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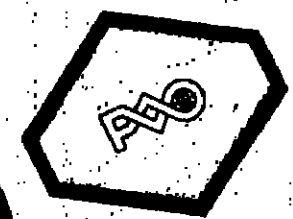
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DRUGS & FINE CHEMS

ing the import of butylated hydroxyanisole (BHA) have thus far been unsuccessful.

BHA, as well as TBHQ, have been prevented from entering Japan for many years, because of concern that they may be carcinogenic. However, early in 1986 some producers speculated that by September, the position may be changed. This has not happened.

And, even if it eventually does happen, social acceptance is bound to be slow in coming. The talk of acceptance has come about recently because of the findings by some Japanese scientists, who approve usage of the antioxidant.

The two domestic sources of BHA, Eastman Chemical Products, Inc., and UOP, Inc., account for almost all domestic requirements. One of the companies carries list prices of \$8.55 per pound for 5,000 pounds and more, \$8.80 per pound for 1,000 to 5,000 pounds, and \$8.90 per pound for 600 to 1,000 pounds. These prices are called stable, and are not expected to change.

ERYTHROMYCIN — Abbott Laboratories' erythromycin antibiotic "PCE" has received Food & Drug Administration approval. The approval came in early September, and Abbott has already begun to market the product.

"PCE," which stands for polymer-coated erythromycin, was developed to provide rapid absorption of erythromycin and at the same time minimize stomach acid. Erythromycin is used for bacterial infections, and especially the treatment of respiratory infections.

A spokesman notes that "PCE's" main advantage is that the polymer coating on the erythromycin particles protects from stomach acid. The spokesman estimates the worldwide erythromycin market to be about \$300 million. The list price of "PCE" is \$21.60 for 60 tablets, to pharmacies.

MEDICINAL PRODUCTION — Aspirin production rose by about 20 percent in second quarter 1986, compared to the first quarter, according to US International Trade Commission. Production was 7,125,000 pounds, compared to the first quarter's total of 5,830,000 pounds. However, this second quarter figure represents a slight drop from the 7,196,000 pounds produced in second quarter 1985. Likewise, the production total for the first two quarters of 1986 was 12,956,000 pounds, down from 14,768,000 pounds for 1985.

Meanwhile, choline chloride production was up about four percent in the second quarter, rising to 13,559,000 pounds, up from the first quarter figure of 13,021,000 pounds. The

second quarter figure is up from the first quarter of 1985's 11,352,000 pounds. Production for the first two quarters is also higher than it was in 1985. Through second quarter 1986, 26,580,000 pounds had been produced, compared to the 1985 total of 24,781,000 pounds.

MSG — Chell Sugar Company, a major source of monosodium glutamate from Korea, is increasing its export price to the US to four to five cents per pound. The increase is said to take effect immediately.

According to an importer of MSG, Chell is the US's largest source of Korean product. Meanwhile, spot prices for MSG are firming and further increases are expected when most contracts are renegotiated after January 1.

Conoco, Nippon Form Venture

Conoco and Nippon Mining Company Ltd. of Tokyo will join in a \$135 million joint exploration venture on selected Conoco acreage in the US and the Gulf of Mexico. The venture is the first with a Japanese firm for the North American exploration arm of Conoco.

Conoco, a subsidiary of E.I. du Pont de Nemours & Co., will be the operator of the program, which calls for about 10 exploratory wells to be drilled in Texas, Louisiana, Colorado, Montana, Alabama and offshore Louisiana.

Six of the wells will be onshore and the remainder will explore offshore areas. The program also includes leasehold acquisitions and seismic activities.

"We expect to drill the first joint well in the Gulf of Mexico's Green Canyon area," said Max G. Pitcher, vice-president of Conoco's North American exploration operations. Nippon Mining will open an office in the Houston area as a result of the agreement. Since 1968, Conoco and Nippon Mining have been partners in a petroleum coke manufacturing facility in Japan.

The agreement, signed last week by Pitcher and Takashi Sakamoto, managing director of Nippon Mining, is expected to bring employment to drilling contractors and others in the five state area.

ORGANICS TECHNOLOGIES, INC. MATERIALS LIQUIDATION

Cat #	Quant.	Avail.
0801	acetoxycetone	700 kg
1011	4-amino uracil	100 kg
1012	uracil	80 kg
1024	4,5-diamino uracil	100 kg
1025	4,6-dihydroxy-pyrimidine	25 kg
1037	2-mercapto-4,5,6-triamino-pyrimidine	100 kg
1040	uracil-5-carboxylic acid	15 kg
1052	cytosine	5 kg
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Canada Pact Could Receive Chemical Assent

The US chemical industry would support a free trade agreement with Canada if certain "fair and equitable conditions" can be met, an industry trade expert says.

Myron T. Foveaux, trade and economic policy advisor for the Chemical Manufacturers Association, told representatives of the Office of the United States Trade Representative these conditions include:

- Balanced benefits in chemical concessions to both the US and Canada. Currently, Mr. Foveaux says, "US average bilateral trade weighted chemical tariffs on Canadian imports are less than half those on US exports to Canada."

- Non-tariff trade barriers, such as inadequate protection of intellectual property rights, must be corrected, he says. "Recently announced changes in Canadian drug laws do not adequately address the problem," he adds.

- US import remedy laws and procedures shouldn't be suspended under any agreement with Canada.

- There should be an adequate and binding dispute settlement provision, Mr. Foveaux says, "including time limits and provision for private sector input."

Mr. Foveaux explains that this country's chemical industry exports are \$22 billion annually, or about 10 percent of the industry's total sales.

"Although it is one of the few industries still providing a trade surplus to the nation's over-all growing trade deficit, that surplus is decreasing annually," Mr. Foveaux notes. "And the Department of Commerce estimates the chemical trade surplus will diminish again this year." US chemical trade with Canada leads all other countries.

The Office of Chemical Industry Trade Advisor is a coalition made up of Chemical Manufacturers Association, Synthetic Organic Chemical Manufacturers Association, Society of the Plastics Industries and the National Agricultural Chemicals Association.

Roche Sues

Continued from Page 5

the court in August. Amgen's brief asked the court to determine that its own production of a bioengineered interleukin-2 product does not infringe Cetus's patents.

Cetus says it holds the only US patents on interleukin-2 and its analogs made by genetic engineering. "By seeking a declaration that it was not infringing Cetus' patents, Amgen has revealed its uncertainty about its own position," claims Robert A. Fildes, president and chief executive officer of Cetus.

"Proleukin" interleukin-2, an analog form of interleukin-2 created by Cetus is currently in advanced human clinical studies around the US.

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Formaldehyde Makers

Continued from Page 7

Department of Housing & Urban Development. Eventually, overlapping jurisdictions will be eliminated as the agencies work out their own territories, but meanwhile, industry spokesmen must deal with all four, at considerable expense of time and funds.

Mr. Howlett noted that OSHA, in the rules its people are preparing, has failed to make any distinction between long-term (a full shift) and short-term exposure to formaldehyde in factories. The Formaldehyde Institute has determined that 2 parts per million would be a sufficiently low limit for batch operations in which workers are exposed no more than one hour. Existing law, he said, allows 10 parts per million, as compared with 3 parts per million for full-shift exposure.

The Institute, Mr. Howlett added, has approved OSHA's plan to establish "action levels." Under this proposed rule, if a plant's emissions are at only half of the permitted level, OSHA eases a number of monitoring and reporting requirements.

OSHA had expected its final rule to be promulgated in September of 1987, but Mr. Howlett believes that the date will be pushed back to January 1988, based on his previous experience with the agency.

EPA had been working on rules for workers in factories, but it will probably bow out now that OSHA is far along in its rule making, Mr. Howlett said.

EPA also has approached the problem of formaldehyde emissions from building products in mobile homes, but again it has the option of deferring to HUD in this area, since the latter has already promulgated stringent standards for homes.

Mr. Howlett noted that most of the hard-

wood plywood used in the US is now made in Indonesia, the Philippines and other Asia states. This once large market for US-produced formaldehyde (as glue) has been more than replaced by the growing market for particle board as a replacement for wood, he said. Some 10 percent of US particle board is used in mobile homes, 20 percent in conventional housing and 70 percent in industrial outlets, mostly for furniture, in which particle board is being increasingly used as a replacement for wood.

Dr. Hayes questioned the scientific methods of a study by Dr. Thomas L. Vaughn and associates at the University of Washington in Seattle, which claimed to find a significant correlation between exposure to formaldehyde and development of cancer. He said most of the data were based on interviews of survivors of workers who had already died, and that there is no way to evaluate the accuracy or objectivity of such retrospective testimony. "The Vaughn study is open to a lot of questions," Dr. Hayes said.

John F. Murray, president of the Institute, and Edward J. Stana, director of public affairs, said the institute may propose the convening of a blue ribbon scientific panel to review the data and draw its own conclusions.

INC Signs Accord

Immuno Nuclear Corporation, Stillwater, Minn., has signed a distribution agreement with Boots-Celltech Diagnostics Inc., N.J. subsidiary of the English concern. Under the terms of the agreement, Immuno Nuclear will become the exclusive distributor in the US and Canada of the immuno radiometric assays produced by Boots-Celltech.

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Tax Reform to Worsen Deficit, Says NAM's Chief Economist

Comprehensive tax reform legislation currently before Congress "will worsen the US trade deficit and seriously undermine the competitiveness of US firms," a spokesman for the nation's manufacturers charged last week.

Jerry J. Jasinowski, executive vice-president and chief economist for the National Association of Manufacturers, told the joint economic committee the tax reform proposal will have both positive and negative effects on the economy and competitiveness.

"The major positive elements of the bill include substantial tax rate reductions on individuals and businesses paying high tax rates," he testified.

"The major negatives are that revenue losses are made up primarily by removing incentives for investment, with the result that the burden of taxes will be shifted primarily onto capital intensive manufacturing firms that are heavily exposed to international competition."

The NAM economist said each piece of the reform equation — positive and negative — is inextricably tied to the next, and that each must be viewed as part of the economic whole.

"The condition of the overall economy is of great importance in determining performance in international markets," Mr. Jasinowski notes.

"In this respect, based on net exports, the trade deficit feeds back into GNP growth, but at the same time is figured partially on the level of domestic consumption of imports, which depends on the growth in GNP."

"Thus, certain general economic consider-

ations, like the possibility of recession, or implications for interest rates and the exchange rate, will influence the size of the trade deficit," he says.

Mr. Jasinowski also says tax reform will raise the cost of capital by large magnitudes, raising the cost of production for manufacturers with direct foreign competition. He claims this increase in the cost of capital will lower productivity growth, thereby raising unit labor costs.

"Neutral" tax reform is a misnomer when viewed on the tax treatment of income and consumption, Mr. Jasinowski adds.

"The tax bill will move the tax system even further away from taxation of consumption and will further penalize savings and investment. The redistribution of \$120 billion in taxes from individuals to business will only further stimulate consumption, thereby raising the demand for imports and pushing US trade further into a hole," he says.

Congressional aides worked out the final details of the tax bill last week in preparation for a final vote in the House, perhaps this week, and later in the Senate. The outlines of the sweeping measure were agreed to by House and Senate negotiators last month.

Rhone-Poulenc Isocyanates

A previous report on industry expansions in aliphatic isocyanates (CMR, 9/8/86, pg. 3), failed to mention projects by Rhone-Poulenc. The company is building a new 5,000-ton-a-year hexamethylene diisocyanate unit at Freeport, Tex. and expanding its existing 2,000-ton plant at Pont de Claix, France, by 3,000 tons annually.



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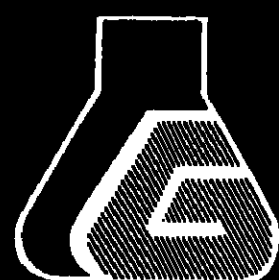
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US Textile Imports Are Cited As Part of 'Bigger' Problem

The US import problem is "a catastrophe, not just for the domestic industry, but for America as well," according to Robert G. Laidlaw, first vice-president of the American Textile Manufacturers Institute, who maintains that at this point the US is being asked to provide fuel for economic growth in the rest of the world through loans, investment or trade.

Speaking at the 1986 annual conference of the International Textile Manufacturers Federation in Helsinki, Finland, Mr. Laidlaw told members, "there is nothing fair, equitable, orderly or even rational about the current trend of textile and clothing imports into our market."

"While our concerns may to many seem parochial and unduly protectionist, let me hasten to point out that they are merely reflective of much wider and deeper problems. Just as all 166 countries exporting textiles and garments to the US cannot each have 1 percent of our market...so, too, can the world's trading system and the free world's entire economy no longer endure the imbalances that are currently straining them to their very limits," he says.

"We cannot make any more loans until we start collecting on the ones we have already made," Mr. Laidlaw adds. "Our manufacturing industries cannot make any more investments because they are having a hard time generating the cash flow to do so and we can no longer afford to donate \$170 billion annually — this year's projected trade deficit — to the rest of the world's economies."

"Textile and apparel imports into our home market reached new record levels during 1985 — as they have for each of the last ten years — and are soaring to even greater heights this year."

Last year, Mr. Laidlaw noted, total imports were 13.6 billion square yards, 10.8 billion yards of products covered under the multi-fiber arrangement — cotton, wool and man-made fiber — and 2.8 billion yards worth of imports formerly outside the reach of the multi-fiber arrangement.

He says that current import levels repre-

sent more than 250,000 lost job opportunities for American workers. "Our trade deficit in textiles and clothing is running at an annual rate of \$20 billion."

Mr. Laidlaw says that the American textile industry remains "determined not to stand idly by and allow government bureaucrats to export the American standard of living."

"We in ATMI believe that the American people, speaking and acting through their Congress, will not allow that which has made the United States the most powerful nation on earth — a strong manufacturing industry — to be eroded away."

Phosphazene Patents Filed

Polymeric "tools" for a broad variety of industrial tasks are described in new US and foreign patent applications just filed by Research Corporation, the Tucson-based foundation for the advancement of science and technology.

Developed by Drs. Harry R. Allcock and Paul E. Austin at Penn State, the "tools" are macromolecules, members of a new class of water-soluble polymers with potential use in a multitude of fields.

Known as polyphosphazenes — technically poly (alkyloxyalkoxide) phosphazenes — the polymers may find application in the controlled-release delivery of drugs, fertilizers, pesticides and other compounds.

Polyphosphazene polymers are also said to be promising as foam control agents for the manufacture of paint, paper and antifreeze, for example, and in the fermentation-based manufacture of antibiotics and foodstuffs. Still other applications are pending in food processing and water purification.

The polymers are reported especially suitable for controlled release of pharmaceuticals in the body because of their biocompatibility and stability (they could be designed to slowly dissolve in the gastrointestinal tract, hydrolyzing into harmless small molecules).

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Acid Rain Legislation Unlikely As Congress Nears Recess

Supporters of an industry-opposed bill to control emissions linked to acid rain conceded virtual defeat last week in their efforts to push the controversial legislation through Congress in 1986.

"With the few weeks we have left in this session, it's unlikely we can pass an acid rain control law this year," says Rep. Henry Waxman, (D-Calif.), chairman of the House energy and commerce health subcommittee. Congress plans to adjourn for the year on October 5.

The full Energy and Commerce Committee met twice to consider the Waxman bill just before the August recess, but opponents used a variety of procedural tactics to stall action, such as objecting to the panel meeting while the House was under the five-minute rule.

In the Senate, Sen. Robert Stafford, (R-Vt.), chairman of the Environment and Public Works Committee, says his panel is ready to send acid rain legislation to the floor, but will delay action until there is movement in the House.

"The cards are clearly stacked against getting anything done," says a spokesman for the National Audubon Society, one of many environmental organizations backing the legislation.

The bill would give Environmental Protection Agency and the states broad discretion in regulating emissions of sulfur dioxide and nitrogen oxide, considered by some scientists to be acid rain precursors.

Of special interest to the refining and petrochemical industries, the bill calls for emissions reductions from industrial processes, and for reducing the sulfur content of diesel fuel.

Peter Sipple, manager of energy policy for Air Products & Chemicals, Inc., has testified

the bill would cause major industry expenses from fuel switching, increased transportation costs, and capital costs from installing scrubbers.

He also points out that the bill recommends subsidization of major residential rate increases at the expense of business.

According to the Congressional Office of Technology Assessment, the cost of compliance with the proposed bill could reach \$9.2 billion per year by the early 1990's.

ICI Makes Grant To Composites Lab

ICI Americas, Inc. granted \$1 million to the University of Delaware's center for composite materials for the construction of a 35,000 square-foot composites manufacturing science laboratory at the Newark, Del., campus.

The laboratory will draw together 150 people, including 74 graduate students and 23 faculty members from the chemical, civil, electrical and mechanical engineering departments, ceramics and materials science in a multi-disciplinary program to develop advances in composite materials and related sciences.

Primary effort at the laboratory will focus on finding solutions to problems encountered in composite materials production and processing, involving mechanics and design science, materials design and durability and computation software.

In announcing the grant, Harry Corless, chairman of ICI Americas, said, "The University of Delaware's Center for Composite Materials, founded in 1974, is widely regarded as being the leading center for composite research in the United States."



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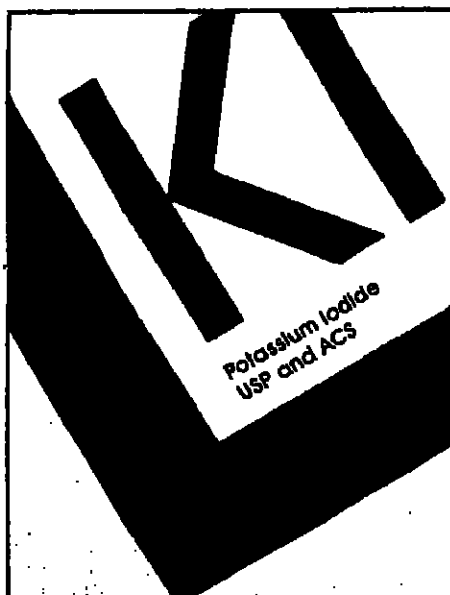
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PERFUMES & FLAVORINGS

Dillweed Oil Market Tightens As Domestic, Imports Clash

West Coast dillweed oil prices have climbed from \$6.90 per pound to \$7.25 to \$7.75 per pound in the last two weeks. Eastern European dillweed oil prices have held steady at \$6.50 to \$6.90 per pound f.o.b. New York. The lower prices of imported dillweed oil have stabilized spot prices at \$7.00 per pound.

Hungarian and Bulgarian dillweed oil, produced almost exclusively for export to the US, is underselling the US material because the Europeans are releasing the last of their 1985 carryover.

"The Eastern Europeans haven't sold all of last year's yield and are keeping the prices down," says an essential oil importer. The European dillweed oil is offered in the US because "pickles using the dillweed oil are mostly an American dietary component. Europeans don't generally eat them."

An oil broker stresses seasonal timing as being behind the European pricing: "Importers are getting rid of the old crop dillweed oil while the West Coast material is still higher, and before the new crop comes in."

The strategy seems to be working in that there are already reports of limited availability of the European dillweed oil. "Very little old crop European can be purchased right now," says another broker, "and though quantitative estimates are not available, the new crop production is underway."

US PRODUCTION OUTLOOK

The US production situation points to an overall tighter market. A major dillweed oil supplier relates a substantially lower production outlook:

"This year's US dillweed production will be 25 percent less than last year's, down from 2,270 acres harvested to 1,820 acres harvested." The carryover from last year, he says, was down sharply, from 20,000 pounds the year before to 3,600 pounds.

According to a domestic dillweed grower, the European and American products are qualitatively different. "Organoleptically, the two products are not the same. The flavor imparted by the European material is closer to dillseed oil than dillweed oil. But this may not matter to a pickle packer in the long run."

"Relative carvone levels are also an issue. One trade source stresses the West Coast prices include a guarantee of minimum 37 percent carvone, "straight natural dill, while some incidence of cut dill has occurred on the street." He also notes that "the European dillweed oil runs generally higher in carvone levels than the US oil."

The urgency with which the imported dillweed oil has been offered to US buyers has led to speculation on the upcoming European crop. Late price quotes on remaining 1985 Hungarian oil have been as high as \$17 per kilo, says one buyer.

"It's difficult to tell if they're short or if they're trying to raise the price for future purposes," he says. Another trade source con-

tends that the 1986 crop may be spoiled by the Chernobyl accident, but this is completely unsubstantiated.

Regardless of the state of the foreign dillweed oil crop, says a domestic producer, "the

PRICES TRENDLINES

WEEK ENDING SEPT. 19, 1986

CHANGES/UP

Anatto Seed, Dominican, 4c. per lb.
Bergamot Oil, Italian, \$3.75 per kilo
Cassia, Korintzi A, 35-4, 5c. per lb.
Clove Leaf Oil, Indonesian, 30c. per kilo
Cumin Seed, Indian/Jordanian, 24c. per lb.
Cumin Seed, Chinese, 37c. per lb.
Cumin Seed, Turkish, 34c. per lb.
Eucalyptus Oil, Chinese Citronella, 35c. per kilo
Oleoresin, Chinese 90%, 60c. per kilo
Oregano, Greek and Turkish, 10c. per lb.
Pappasmint Oil, Chinese, 10c. per kilo
Rosemary, Spanish/Portuguese, 2c. per lb.
Sage, Dolmaron Prime, 10c. per lb.
Sage, Albanian, 15c. per lb.
Sage, Turkish, 5c. per lb.

CHANGES/DOWN

Caraway Seed, Dutch/Polish, 1c. per lb.
Cardamom, Indian blackhead, 25c. per lb.
Celery Seed, Indian, 1-2c. per lb.
Chiliol, Pakistani/Dundicut, 2c. per lb.
Ginger Oil, Chinese, 52 per kilo
Ginger Oil, Indian, 52 per kilo
Majoram, French, 2-5c. per lb.
Pappasmint Oil, Brazilian, 5c. per kilo

PERFUMES INDEX

The Perfumes & Flavorings Index reflects the prices of 11 representative materials in this sector and the quantity of each supplied in 1985.

Sept. 19, 1986 71.00
Sept. 12, 1986 71.00
Aug. 22, 1986 71.00
Sept. 20, 1985 71.00

Chemical Prices Start on Page 52.

trend being established by both the domestic and imported markets is that of continuing tightness and firmer prices."

ESSENTIAL OILS

BERGAMOT OIL. — Expressed bergamot oil continues firming at \$44 per kilo, cost and freight, New York, up from \$40.25 per kilo last week.

"The oil is enjoying an upturn after a depressed market of the past two years. The price of the bergamot fruit has been very low," says an importer, "primarily because of the strong dollar and its effect on Italian production."

The dollar, at a peak against the lira in March 1985, made it difficult for Italian growers to secure a profit. According to an importer, "they received very low returns on their investments." The producers then harvested less oil, losing interest to the point that

Continued on Page 49

PERFUME & FLAVOR IMPORTS: JULY

CENSUS BUREAU REPORTS ON THE KEY AROMA CHEMICALS

	JULY '86	JUNE '86	YR to Date '86	JULY 1985
Benzyl Acetate	122,136	141,977	795,109	63,774
Castoreum	27,848	2,481	41,969	11,717
Citral	6,173	125,413	1,400	1,400
Citronellol	93,288	19,841	21,830	264,918
Civet	2,379	41,785	240,088	99,831
Ethyl Vanillin	50,702	20,883	186,788	37,847
Eugenol/isoeugenol	25,099	9,007	62,880	14,730
Geraniol	38,898	15,882	280,407	79,730
Hydroxycitronellol	2,200	2,304	417,328	19,730
Indole	37,170	78,815	474,787	14,730
Ionone	144,403	89,848	1,539,738	27,818
Linalyl Acetate	219,382	82,908	1,539,738	27,818
Menthyl Salicylate	182,383	54,575	943,881	40,930
Nile, aryl	145,892	152,285	888,234	28,820
Phenylethyl Alcohol	165,099	87,230	1,048,793	28,820
Rhodiol	344,168	843,890	9,433,949	28,820
Vanillin				

Chemical Marketing Reporter

CHEMICALS SHIPPING '86



Shippers Are Seeking More Flexibility

Chemical Industry Shift to Specialties
Favors Trucks at Expense of Rails
As Distribution Becomes More Complex

By VINCENT O'SULLIVAN

As the chemical industry gradually shifts its portfolio toward specialty chemicals, trucks will gain a greater share of the industry's transportation needs at the expense of rails. While trucking is more expensive per freight mile than rail, shippers will look for the greater short haul flexibility of trucks to accommodate the more complex distribution of higher valued chemical products.

In addition, chemical buyers, aiming to reduce their average stocks as they embrace "just in time" inventory methods, will request a growing number of trucked shipments. The return on the additional cost will be a reduction in inventories as less stock moves across the country in freight cars.

Overall, chemical shipments inland, the second largest freight volume after clay and cement, will grow by an estimated 4.5 percent per year through 1990. Reeble Associates of Greenwich, Conn., says that total domestic shipments in 1995 were 364.3 million tons. Of that, 28 percent, or 102 million tons, moved by rail, while 60 percent, or 218 million tons, went on board trucks. The remaining traffic, 45 million tons, or 12 percent, went by barge. Analysts forecast that truck shipments by volume will grow fastest.

SHIFT TOWARDS TRUCKS

Reeble sees truck growth at 4.4 percent annually by volume, rail at 4.2 percent and barge at 3.7 percent volume growth per year. "Chemical companies who own (rail) tank cars see a shift towards trucks but the change is slow in coming," says Peter Stone of Reeble.

Agricultural chemicals are the single largest component of chemical shipments in the US. They also depend largely on rail. Due to a slow reduction in the US share of world fertilizer markets and a flagging US farm economy, they will have the largest impact on slower growth in chemical rail loadings. "Production of agricultural chemicals is down and this drags rail (shipments) down," observes Bernard Campbell of Data Resources Inc.

Dow Chemical Company says its current inland shipping needs are evenly divided between rail, truck and barge. But the company is on a "long term program to shift to higher valued downstream products," according to Paul F. Orefice, Dow's president and CEO.

Dow's manager of transportation, government and public affairs, Keith Bunting, comments, "With the changes our company is going through we may become more trucking oriented."

Trucks are more adaptable to a specialty business, says Mr. Bunting, since they can accommodate smaller volumes, lighter loads and most importantly, a larger number of distribution points. Taking a long term view, Mr. Bunting

The chemical industry's shift toward specialty products, combined with the emergence of "just in time" inventory methods, favors increased reliance on trucks, rather than rail, as a shipping method. Also hurting rail is the downturn in agricultural chemicals, which are largely transported by rail. On the whole, inland chemical shipments are expected to grow 4.5 percent a year through 1990.

Chemicals Shipping '86: Trucking Set for Gain

RAIL AND TRUCK: Trucking is expected to gain at the expense of rails Page 29

WASHINGTON: Lawmakers are seeking tougher truck safety laws Page 32

INTERNATIONAL: Implementation of anti-pollution regulations angers shippers Page 34

CHEMICAL STORAGE: Overcapacity in chemical storage industry appears to be easing Page 41

COMPANY FLEETS: Price war among commercial carriers is expected to cease Page 36

SMALL LOTS: Less-than-truckload shipments serve an important function. Page 38

US WATERBORNE: Chemical barging business shows signs of a recovery Page 40

CHEMICALS SHIPPING '86 RAIL AND TRUCK

expects Dow's use of trucking to expand to between 40 and 45 percent of its total inland volume.

E.I. du Pont de Nemours & Co., a company that is expanding its specialty business but maintaining a large stake in commodity materials, says its trucking volume is up by a total of 10 percent in the last five years, while its rail volume is down by about 7 percent. Also as a result of deregulation and better trucking rates and services, the company has largely spun off its in-house trucking fleet since 1981.

This company feels, however, that there

are areas where rail could see strong growth. "Intermodal methods," says Clifford Sayre, director of logistics for Du Pont, "have not realized their full potential." Speaking specifically about inland shipment, Mr. Sayre points out that cooperation between rail and truck could be better.

"Since the late '70's, rail didn't want to give anything away to trucking and vice-versa," he explains. While ocean-going shipments have gone around the problem with through bills of lading and ocean-going containers, domestic traffic is lagging. "Intermodalism is starting to realize its potential in the interna-

tional market place," explains Mr. Sayre, "but it has come up short on the inland routes."

Mr. Sayre also sees greater use of backhaul routes as a possible money saver for railroads and a step towards lower overall shipping costs.

For instance, his company's acetonitrile unit in Memphis exports products to the far East, while a Nissan plant close by imports material from Japan. He sees this as a great opportunity to backhaul his material to the Pacific.

However, Mr. Sayre laments that antitrust laws don't allow Du Pont to talk to Nissan on a move that might lower their shipping costs. "It's up to the transportation company to fill their backhaul routes," he concludes.

FMC, another company with diversity in specialty and commodity chemicals, is bucking the trend away from rail with expansion of its piggyback fleet. In total, the company ships 80 to 85 percent of its tonnage by rail. FMC is expanding its piggyback container fleet from a current fleet of 600 to an estimated 2,500 to 3,000 in the next two years.

BOXCARS BECOMING EXTINCT

John Noll, FMC's traffic manager for the industrial chemicals group, says that "boxcars are becoming extinct." Piggyback containers and increased utilization of intermodalism has been given a shot in the arm by deregulation, which he says "has forced both trucking companies and rail lines to look for innovative ways to compete in the marketplace."

American Hoechst also reports strong interest in intermodal and has recently started moving its material it imports from Europe to Atlantic ports on double stack cars. Ten percent of the company's sales, according to Michael Piron, vice-president of corporate chemical transportation, are imports. He estimates that since starting double stack shipments six months ago, about 5 percent of its imported material is moving through double stack.

Other companies say that double stack shipments have not been a real option for them. The method is most appropriate for lighter, dry materials, rather than hydrous, more dense compounds that would pose weight problems in a two-tiered stack.

As innovations emerge in rail and truck, insurance questions arise as handling becomes more complex and dangerous. Ideas such as rail truck transfer where material is pumped directly out of long haul tank cars into short haul trucks to support a hub and spoke distribution system has been largely ignored by chemical companies. Shippers



HOPPER CAR: Rail transportation of agricultural products is following the downturn in the US farm economy.

are looking to reduce their liabilities and have been slow to accept this method.

Hoechst has, however, adopted rail truck transfer to move granular polyethylene from Texas to Indiana. The material starts out in 190,000-pound capacity rail cars and is drawn out in truckload quantities by agents in the Midwest.

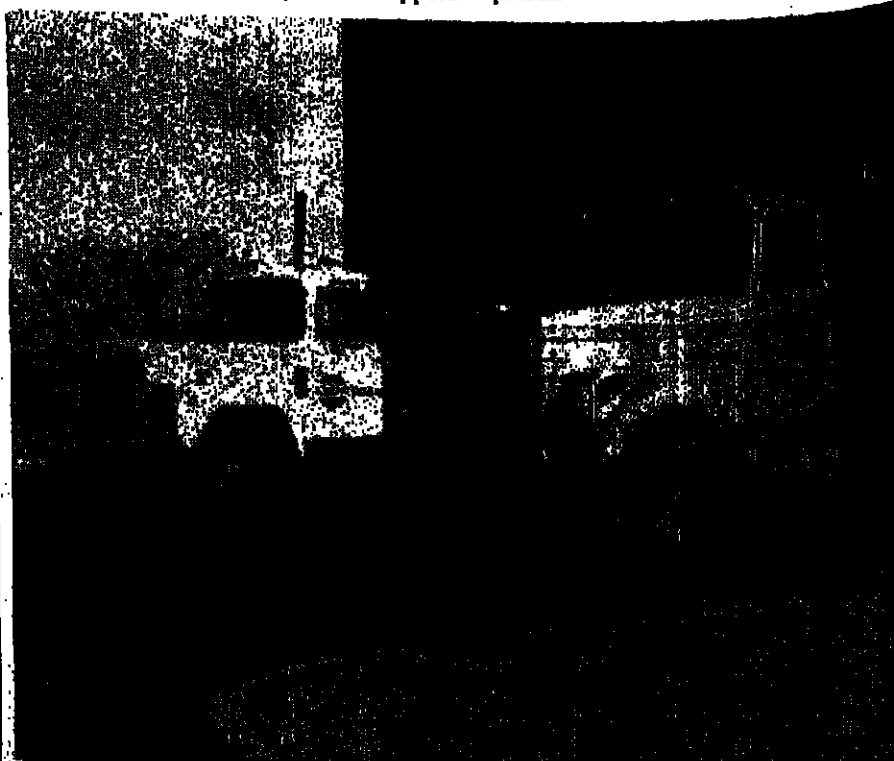
While rising insurance rates have been a broad based industry problem, chemical shippers have seen minimal impact so far. Transport companies, particularly truckers, however, have had to bear a large burden of higher rates, according to Mr. Campbell of Data Resources. "Truckers have been battered by the insurance problem."

However, he notes that "railroad performance on accident, loss and damage has been exceptional." If it were not for this, railroads would have seen much higher insurance rates and be poised for an even greater loss of market share than is already predicted.

What has been most difficult for truckers is their inability to pass increased costs along to customers. "To some extent they (truckers) pass higher cost along but in most cases they eat them," according to Mr. Campbell. Extreme competition and overcapacity among truckers has made price increases very difficult.

Truckers have made some gains in cost improvements this year, however, as diesel fuel prices have fallen considerably.

Railroads, carrying about the half the percentage of fuel cost of truckers, have not benefited as strongly from lower diesel prices.



DOW CHEMICAL Company expects its use of trucking to expand to between 40 and 45 percent of its total inland shipping volume. Trucks are more adaptable to its specialty business, the company explains.

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CHEMICALS SHIPPING '86

WASHINGTON

Truck Safety Laws Draw Fire on the Hill

By GLENN HESS

While the number of train accidents involving hazardous chemicals has declined sharply since safety features were added to tank cars in the late 1970's, some members of Congress say they are concerned that similar progress is not being made on the nation's highways.

"Truck safety laws in this country are a sham," declares Rep. Timothy E. Wirth (D-Colo.), chairman of a House subcommittee on telecommunications, consumer protection and finance.

"Lives are being threatened by weak, confusing laws which are supposed to be governing the shipment of hazardous cargo," he says. "We need stronger, more effective legislation to guard against senseless, preventable accidents."

Rep. Wirth has introduced sweeping legislation to overhaul the Hazardous Materials Transportation Act, which expires on September 30. But with time running out in the current legislative session, Congress is expected to reauthorize the existing statute for another year and then consider substantive changes in 1987.

Rep. Wirth, along with Reps. Cardiss Collins (D-Ill.) and James J. Florio (D-N.J.), released a study earlier this year which blamed human error for about two-thirds of transportation accidents involving haz-

ardous substances, such as toxic chemicals and radioactive materials.

Some of the more frequent errors involved loose fittings and valves, improper loading of trucks, and placing heavy freight on top of lighter materials—all of which could be avoided by proper worker training.

A study by the Congressional Research Service of the Library of Congress says Department of Transportation's general training regulations for transportation workers handling hazardous cargoes "can, at best, be considered to be vague."

"They do not specify the nature, content, objectives or length of required instruction, its desired frequency or when new employees should be trained," the study says.

"DOT's regulations do not require a certification or a testing program designed to ensure that these workers have a basic understanding of, and sensitivity toward, the hazardous properties of and risks associated with the chemicals with which they are dealing," according to the study.

Most drivers transporting hazardous cargoes have to take, but not necessarily pass, a 66-question open-book examination.

"DOT's examination does not test whether someone is trained in, or has a basic understanding of, emergency response procedures appropriate to the job and responsibilities of being a driver of a truck transporting hazardous materials," the study says.

It cites a request by Clifford Harvison, president of the National Tank Truck Carriers Inc., to require newly hired hazardous transportation workers to achieve a passing grade on a written exam.

A subsequent study by the Office of Technology Assessment found that many incidents involving hazardous substances are not reported to Federal accident and spill record-keeping systems, and that damages average more than \$160 million per year, at least ten times higher than the annual amount reported to Congress by DOT.

The report cites inconsistencies in state and local regulations, which often are confusing and burdensome for industry and enforcement officials. "Data and information about shipments are so poor and difficult to acquire that state and local regulations are often developed with little or no understanding of the magnitude or nature of the problems to be controlled," the report observes.

The study also notes that despite the widespread risk of accidents involving hazardous materials, up to three-quarters of the nation's 1.5 million firefighters, police and emergency medical personnel lack proper response training.

The Wirth bill, which is opposed by the Reagan Administration, would centralize administration of several Federal laws relevant to hazardous materials transportation that are currently carried out by several agencies within DOT.

The legislation would authorize increased funding for Federal and state safety inspections and audits, and require drivers hauling hazardous cargoes to have proper training and to maintain a safe driving record.

EMERGENCY RESPONSE

Grants would be authorized for emergency response training for firefighters and local police, who often arrive first at the scene of an accident. The bill would also authorize grants to states and localities for designating routes for safe transport of hazardous materials, and require DOT to issue guidance.

Philip W. Haseltine, deputy assistant secretary of DOT, says the Reagan Administration agrees with the underlying objectives of the Wirth bill, but maintains it is unnecessary because the department is moving to correct the problems the legislation addresses.

Mr. Haseltine acknowledges there are "serious weaknesses" in driver training programs but says they will be corrected by proposed regulations that would require states to follow minimum Federal standards for trucking licenses.

The proposed regulations would prohibit tank-truck drivers from holding multiple licenses and require them to pass road tests in the type of vehicle they operate for a company.

"With a host of legislative, regulatory and policy initiatives either underway or being planned for deployment in the near future, the department asks forbearance on legislation until we have our program in place and functioning," Mr. Haseltine told a July hearing held by three House subcommittees with jurisdiction over highway safety.



Rep. Timothy Wirth

But Paul Rothberg, an author of the Congressional Research Service study, says the regulations proposed in May by DOT fall far short of the requirements contained in the Wirth bill.

Mr. Rothberg says the department's proposals would not cover all drivers of hazardous loads or all workers handling the estimated 180 million shipments of hazardous materials in this country every year.

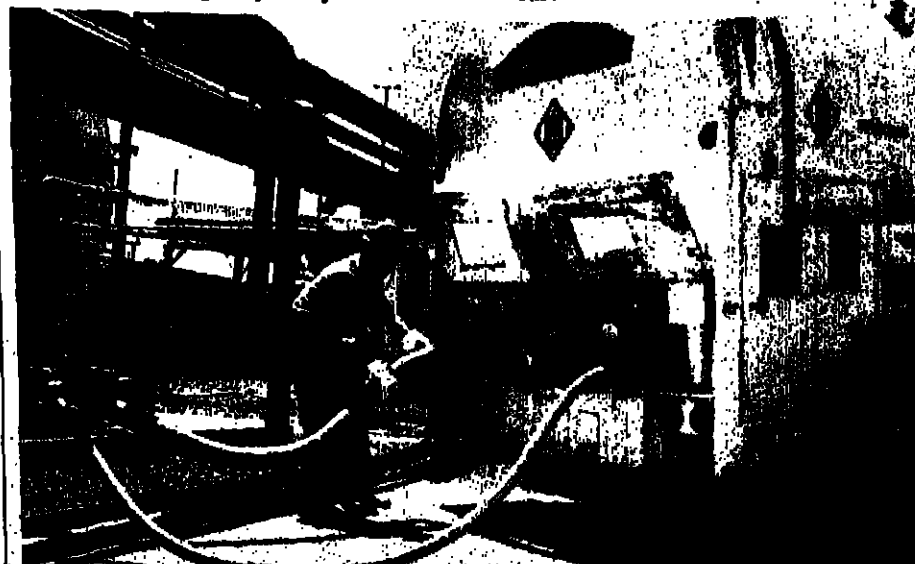
The proposals also would not require drivers to pass a written examination or revise the current DOT exam to ensure that drivers are tested on emergency procedures to be used following an accident, Mr. Rothberg says.

Rep. Wirth says he welcomes DOT's initiatives, but also expresses skepticism. "Fifteen years of rulemaking still has not yielded driver qualifications stringent enough to protect the public," he says. "Without legislation requiring increased qualifications, I fear that DOT's latest effort is but another episode of promises, promises."

Rep. Florio, chairman of a House subcommittee on transportation, also believes that legislation is necessary to help curb accidents and minimize damage.

"Despite the importance of training as a means of reducing the frequency of human error—and thereby dramatically reducing the number of accidents—DOT's regulations are vague, lack consistency and provide little direction to industry, the states or the localities," says the New Jersey Democrat.

Without improved training for those who transport the materials, he adds, "We are simply waiting for disastrous accidents to occur."



TRUCK SAFETY: Lawmakers in Congress complain that not enough progress is being made to improve the safety of truck transport of hazardous chemicals. Current laws are called confusing and weak by congressional critics.

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CHEMICALS SHIPPING '86 INTERNATIONAL

Pollution Regulations Anger Shippers O'seas

By SEAN MILMO

European chemical shipping companies, already deeply frustrated by several years of depressed cargo rates caused by overcapacity, are getting angry about the implementation of anti-pollution regulations due to come into force next April.

Ship owners have invested millions of dollars to ensure that their vessels comply with the new International Maritime Organization (IMO) rules, whose main objective is to reduce the disposal of toxic waste by ships at sea to a minimum.

But as the April 6 deadline — already put back once — draws near, the owners are finding that most governments and port authorities are doing little or nothing themselves to provide shore facilities for the reception and disposal of waste from ships.

"We are deeply unhappy — to say the least," says Trygve Meyer, an official at the Oslo-based International Association of Independent Tanker Owners (Intertanko). "Ships' masters will be under tremendous pressure. They risk losing their licenses if they do not comply with these regulations, yet no one seems to want to help them."

Eric Flotron, secretary of the European Chemical Coastal Tankers' Association (Eccto), which also represents deep-sea operators, warned: "There will probably be chaos when the deadline comes."

The main problem is that governments, port authorities, ship owners, terminal storage companies and chemical manufacturers still cannot agree on who is responsible for the waste, and hence, for its disposal — even though the new rules have been known about since 1973 when the IMO convention was drawn up.

The regulations — called MARPOL Annex II — stipulate certain stripping requirements, depending on the toxicity of the product (categorized from A to D), and a mandatory prewash of cargo tanks for the most dangerous chemicals and those with high viscosity or solidifying substances.

Most of the prewash residues must be transferred ashore for disposal but MARPOL does not specify who should be responsible for this task.

The chemical manufacturers, supported by the storage companies, believe that it is up to the ship owners to ensure that arrangements are made for getting rid of the waste.

"The slops are created by the ship," argues

Brian Rye, transportation officer at the UK Chemical Industries Association (CIA). "Since the ship generates the slops it must be considered to own them."

The owners, on the other hand, think otherwise. "It is the cargo which is the danger and thus ultimately causes the waste," retorts Mr. Meyer. "So the onus should fall on the charterer."

The ship owners associations have drawn up a model contract for their members which puts legal and financial responsibility for the disposal of cargo residues on charterers.

The Bermuda-based Gotaas-Larsen shipping company is already negotiating new contracts with its customers which takes into account MARPOL Annex II. "If there are slops to be disposed of it is for the charterer to make the necessary arrangements," said Danny Sharp, chartering manager at the company's London headquarters.

The UK Government has confused the issue even further by introducing legislation requiring the terminal storage companies to receive the waste from the ships and then insisting that as "holders" of the residues, they are responsible for their disposal.

"That is tantamount to saying that a warehouseman owns what he is storing," says Harrison Call, executive secretary of the UK Independent Tank Storage Association.

GOVERNMENT RESPONSIBILITY

The IMO — a United Nations agency — has meanwhile put the responsibility firmly on the shoulders of governments.

"The convention makes it clear that governments are required to ensure that facilities are provided," says IMO's Information officer, Roger Kohn, at its headquarters in London. "They cannot wash their hands of the whole thing."

The absence of agreement on the matter will probably mean that by next April only two ports in Europe — Rotterdam and Hamburg — will have waste disposal facilities available. Even then they will not be fully operative.

Rotterdam, Europe's biggest chemical port, which has been doing the most to get ready for the deadline, is at present only sure that it will be able to deal with three quarters of waste brought ashore.

But like Hamburg, it is fortunate to be assisted by a government subsidy towards the capital cost of setting up reception and treatment installations.

Many European governments are refusing to provide any financial help, placing much of the burden on ports which are already hard pressed for cash.

The UK government, for example, is sticking resolutely to a "polluter pays" policy, effectively leaving the question of finance to be thrashed out by the ports, storage terminals, ships owners and chemical manufacturers.

"The chemical carriers have been lucky up till now to be able to clean their tanks for free — but at the expense of the environment," says an official at the UK government's Environment Department. "The cost of disposal

will now have to become an additional cost for the whole industry, on the principle that those who cause pollution will have to pay to remedy it."

The ship owners are warning that the extra costs could be considerable if most ports are not properly prepared by next April.

"There could be a tremendous impact on costs if we have to keep slops on board until we reach a port able to receive waste," says Jan Houwers, managing director of Gehr. Broere shipping company in the Netherlands. "Rates will be pushed up and up because there will be a diminishing amount of room on ships for cargo."

There is particular concern about ports in developing countries, most of which are unlikely to have reception facilities for waste, let alone the means for disposing of it.

Annex I of MARPOL, which contains IMO's anti-pollution rules on oil waste from tankers and which came into effect three years ago, has caused few problems because the oil has been easily recycled. Oil and waste

"They (ships' masters) risk losing their licenses if they do not comply with these regulations, yet no one seems to want to help them."

disposal companies have been making a good profit out of the regulations.

The difficulty with Annex II is that since the chemicals are mixed with water at the prewash stage, the residues cannot be recycled effectively.

CEPIC — the European chemical industries association based in Brussels — believes that the amount of waste that will have to be dealt with has been substantially reduced as a result of the introduction of more efficient stripping requirements.

With category B products, which include materials like xylenols, phenol and monochlorobenzene and which are likely to account for the bulk of residues, vessels have to have stripping systems capable of reducing residues to less than 0.3m³.

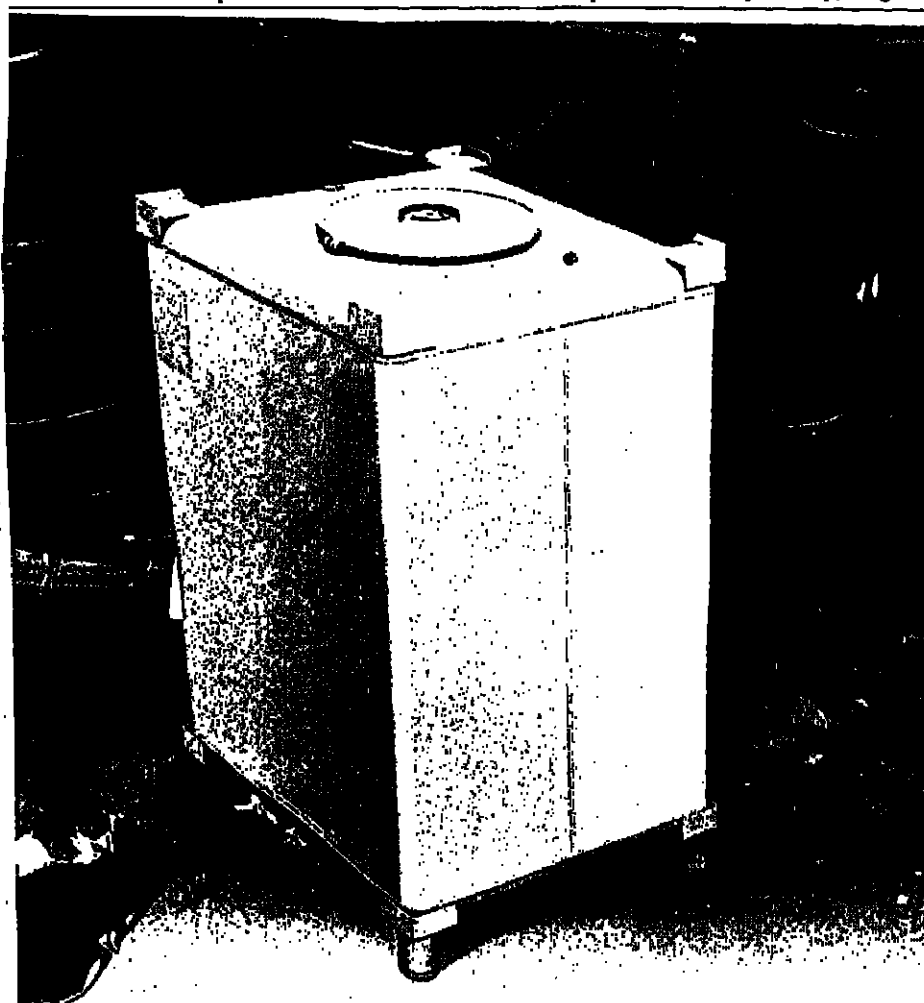
"Under the original rules, which have since been amended, the residues for category B had only to be brought down to several cubic meters — which is a major improvement," explains Rudi Beukers, CEPIC's transport and distribution officer. "As a result, the quantities of waste will be much smaller than first envisaged."

Intertanko is hoping that the amounts of residues will be low enough to enable ports and storage companies to put wastes into barges and even trucks temporarily.

"Perhaps after a while waste disposal companies will then see an opening for doing something on a commercial basis," says Mr. Meyer.

Rotterdam port authority, however, is

Continued on Page 43



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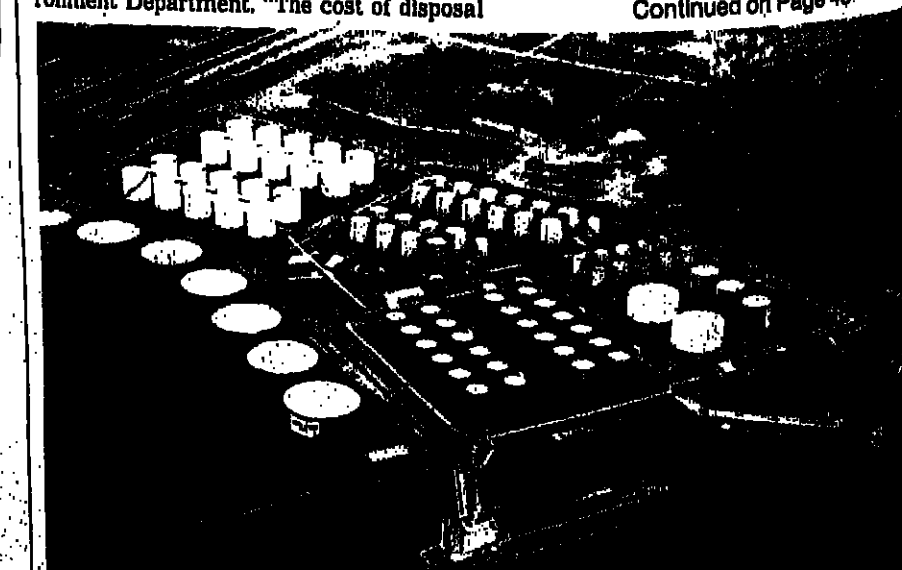
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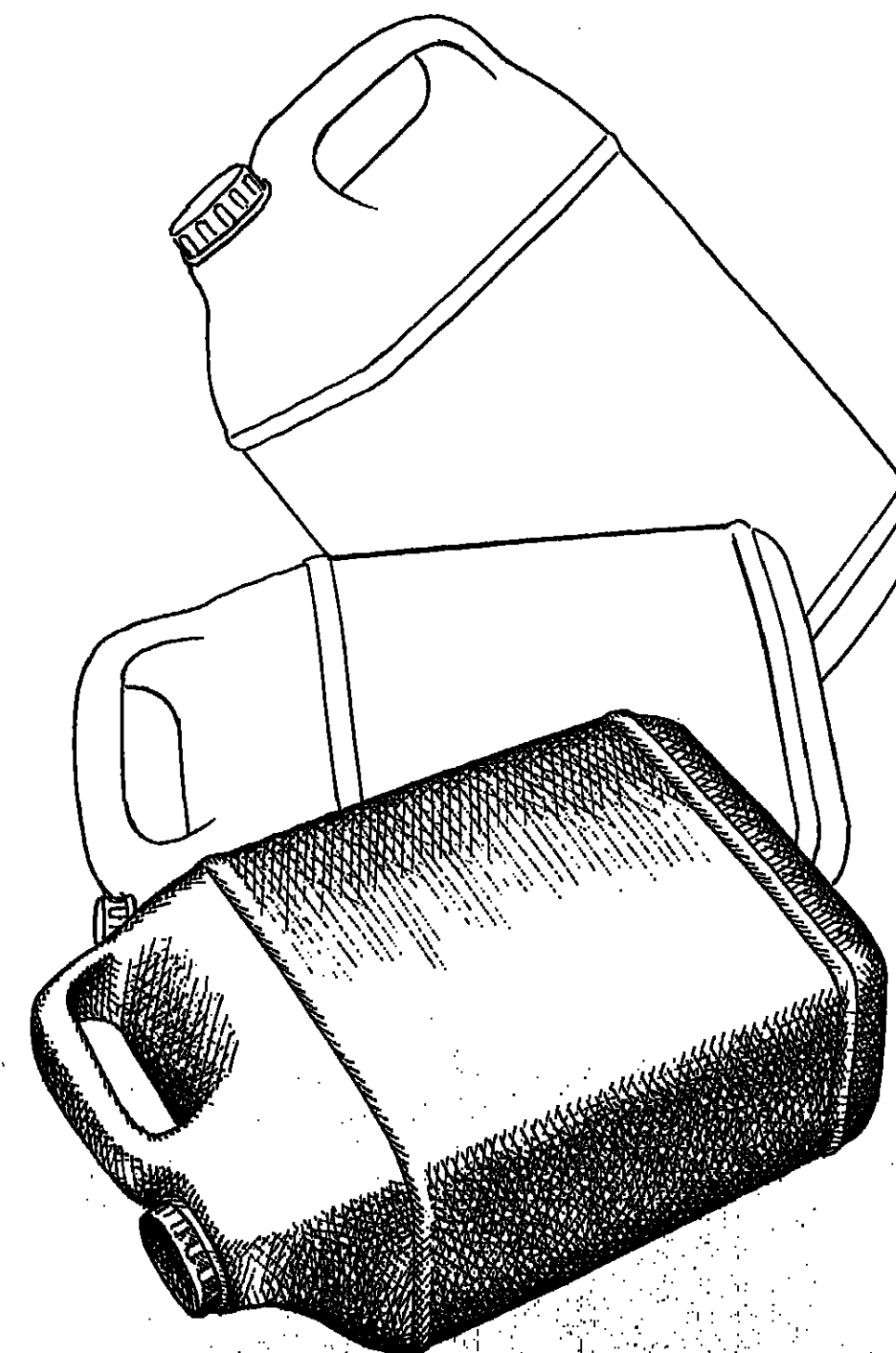
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34 CHEMICAL MARKETING REPORTER



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SEPTEMBER 1986 CHEMICAL MARKETING REPORTER

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CHEMICALS SHIPPING '86 COMPANY FLEETS

Common Carrier Rates Heading for Upturn?

By AGNES SHANLEY

Chemical companies have been reaping the benefits of a price war among commercial carriers in the competitively-charged atmosphere that has prevailed since deregulation of the shipping industry.

Chemical transportation managers and shippers mostly agree, however, that the current situation is not sustainable, and that commercial truck rates are bound to rise.

"Commercial carriers cannot continue to offer services at below-cost prices," says Robert Henderson, executive vice-president of the Private Truck Council.

Jan Hansen, general traffic manager of W.R. Grace & Co.'s Construction Products Division, who sees a shakeout coming in the commercial shipping industry, expects the commercial carriers to stop "their bidding war."

Commercial carriers have been passing on token rate increases, largely swallowing huge increases in insurance premiums. Their customers report that rates have gone up only 2 to 4 percent in the past year.

Insurance costs for commercial truckers, meanwhile, are running 300 percent above 1984 levels and currently amount to an estimated 9 percent of shippers' revenue, compared to 3 percent of revenue in 1984, according to Clifford Harvison, president of National Tank Truck Carriers Inc. Pre-tax profits last year fell to just 0.9 percent of revenue, compared to 4.5 percent in 1978, a good year for the commercial shipping industry.

By contrast, the cost of operating private trucking fleets has remained relatively constant, according to A.T. Kearney Inc., a management consulting firm based in New York.

According to Kearney, average private fleet costs grew just 3 percent over the past four years, to \$1.35 per mile in 1985 from \$1.25 per mile in 1981. During the same period, inflation (as measured by the GNP price deflator) increased 18.9 percent.

Kearney points out that private fleet insurance is usually covered by a blanket insurance policy for the overall corporation. Many large companies, moreover, are self-insured and have seen only modest increases in insurance costs, compared to the commercial fleets.

"All of these trends seem to indicate a healthy and stable role for the private fleet in the total transportation system of the US," Kearney says.

Since deregulation, only 13 of 80 chemical

firms participating in a survey by Kearney reported downsizing their in-house fleet in favor of increased reliance on common carriers. On the other hand, 11 firms said they have expanded their in-house fleets since deregulation, while 56 firms reported no change in private fleet size.

However, the Kearney findings only tell

"half the story," observes Karen Arsenault, a Kearney associate in Chicago. What the survey doesn't reveal, she notes, is the number of private fleets that no longer exist. Moreover, many companies did not respond to the survey.

Large chemical producers contacted by this newspaper mostly reported that, since deregulation, their private truck fleets have evolved into a valuable, but secondary, transportation mode, typically handling less than 5 percent of their total trucking needs.

Most distribution managers cite an increased move to contract-basis, using spot carriers as "fillers." While currently, most chemical firms report that 50 to 60 percent of

the trucking services provided by outside carriers is handled on a contract basis, many plan to increase that figure to over 80 percent in the next few years, while others already have.

As one trucker explains, "contract basis benefits the carrier by offering the guarantee of a more lasting relationship with the manufacturer and a more predictable business environment for investment and equipment and terminal facilities."

Transportation managers also point out the benefits of the contract basis, including the negotiating leverage it provides. As one explains, "with contracting, one can make arrangements. It's like the difference

CHEMICALS SHIPPING '86 COMPANY FLEETS

between buying a car directly from the showroom floor and ordering one specially made with custom-designed features." This ability to control the shipping relationship has made contracting common-carrier services even more attractive than leasing, some say.

Company fleets, on the other hand, are typically used to move hazardous or reactive materials, to link centralized rail or truck routes to out-of-the-way spots, or to handle emergency situations.

Chemical manufacturers, however, prefer to see capital and manpower expended in product development and production. George Koslow, transportation director for PPG Chemicals, summarizes their philosophy:

"A private fleet has to be a profit contributor in and of itself. If services can be purchased cheaply, what advantage can a private fleet offer?" He reports that his firm turns to common carriers (mostly on a contract basis) for most of its trucking needs. PPG's fairly large truck fleet (180 tractors and 350 van-type trailers) is used only in certain bulk transportation operations, and in intercorporate hauling for PPG's glass and coatings and resins divisions.

John Noll, manager of transportation operations for the industrial chemicals group of FMC Corporation, says his division currently has 15 to 20 trailers dedicated to transport of hydrogen peroxide and other reactive com-



GRACE FLEET: W.R. Grace & Co. maintains a large private truck fleet. Its two trucking divisions handle high-volume transport of construction materials and ores, as well as volatile chemicals.

modities. Virtually all of the total annual tonnage handled by truck is moved by common carrier, he says, most of it on a contract basis.

E. I. du Pont de Nemours & Co., fairly representative of many large chemical manufacturers today, had a large private truck fleet, but with the onset of deregulation, downsized it, later consolidating it with its Conoco subsidiary's fleet.

Today, the combined fleet is operated by Conoco, which Du Pont treats like an outside carrier. Trucking, which comprises roughly half of the company's annual transportation costs, is handled by Conoco and common carriers, mostly on contract basis.

Clifford M. Sayre, director of logistics for Du Pont's chemicals operations, says private fleets are "too expensive," adding, "chemical companies prefer to concentrate investments on their own operating facilities."

GREATER FLEXIBILITY

Frank Holzapfel, manager of truck transport for the chemical distribution department of Exxon Chemicals America, says outside shippers afford greater flexibility. "We find that we are better off investing money and management in chemical manufacturing."

Olin Chemical Company has a distribution strategy typical of many chemical producing firms. Roughly 66 percent of its tonnage is handled by rail, 6 percent by barge, and the remainder by truck. Of this total truck volume, most is handled by common carrier, half on a contract basis. The company has a substantial rail fleet, and will own and operate 3,800 railcars by the end of the year. In addition to 21 barges, Olin has few privately-owned trucks, and uses these only for special purposes—typically, for rush orders of hydrazine rocket fuel, or for supplemental bulk shipments of urethane system components.

MANPOWER SAVINGS

As John Badger, manager of distribution for the company, describes its setup, "using outside shipping companies represents a significant manpower savings, in addition to eliminating empty mileage problems." He sees a definite trend away from private fleets in the chemical industry, reporting that many competitors "are analyzing the prospect of selling their fleets and leasing them back, or going common carrier."

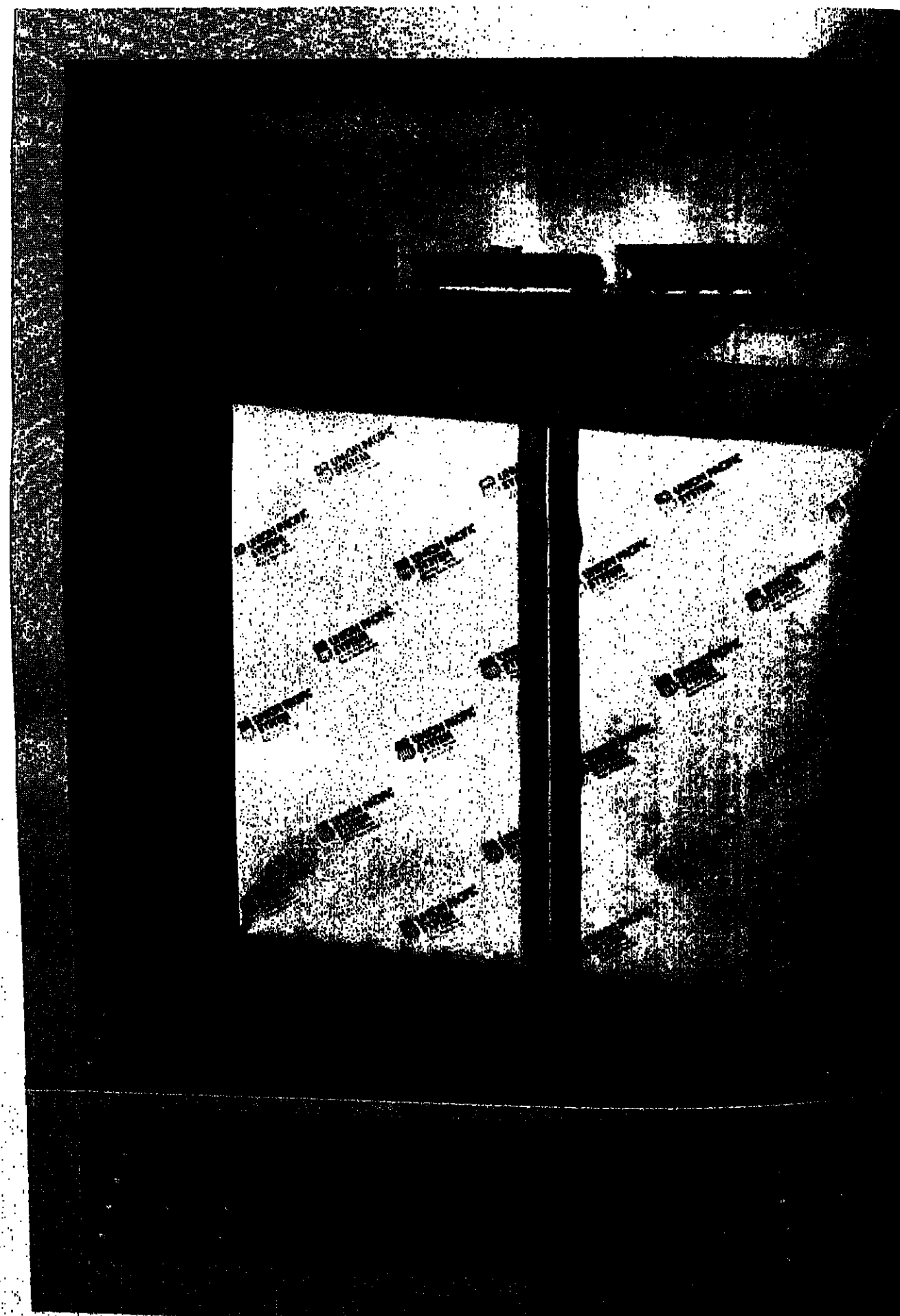
Keith Bunting, distribution manager at Dow Chemicals USA, estimates that his company's in-house fleet handles only 3 to 4 percent of its total trucking volume. "As long as we can find competitively-priced services," he explains, "we see no need to get further into the business."

Similarly, William Friehs, transportation procurement director for the Chemicals Division of Monsanto Company, reports that his firm currently owns and operates a fleet of 26 tractors and 50 trailers which together handle less than 5 percent of the company's annual trucking needs.

Some chemical distribution managers, however, are quick to point out the benefits of private truck fleets, particularly within a highly diversified corporate structure.

W.R. Grace & Co. currently has two private truck fleets, one for its Construction Products Division, and the other for its Distribution Traffic Services Division. Mr.

Continued on Page 49

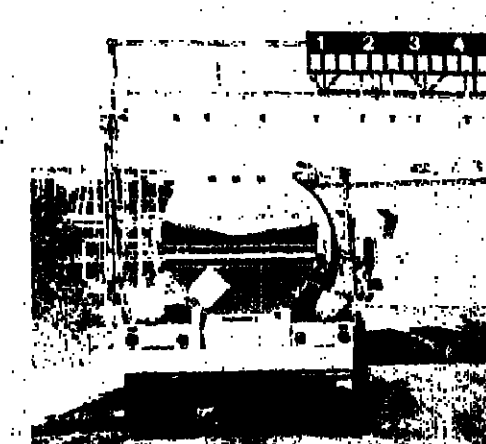
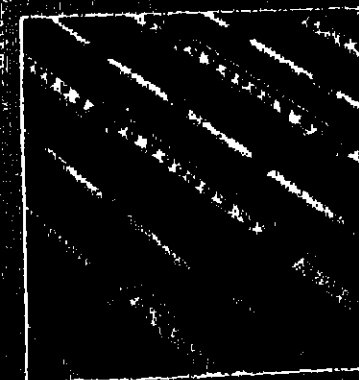


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COMMON CARRIER: Dow Chemical Company relies on common carriers to satisfy most of its trucking needs. Above, a tank truck prepares to leave the company's Joliet, Ill., facility.

CHEMICALS SHIPPING '86 SMALL LOTS

Small-Lot Shipments: Safety Comes First

By STEPHEN KEARNEY

Since many chemical buyers have needs that do not require full truckload shipments, suppliers frequently turn to less-than-truckload shipment (LTL) services offered by common carriers.

When selecting a carrier, a Mobay Chemi-

cal Corporation spokesman comments, "the first criterion is safety, the second is service, and the third is cost." Reichhold Chemicals, Inc. says that it is important to regularly monitor the performance of carriers in order to ensure that reliable service is maintained. Common carriers are frequently relied upon for the hauling of LTL's. In analyzing the merits of a carrier for LTL delivery,

considerations involve whether the carrier has sufficient insurance coverage and an acceptable loss to damage ratio.

With the emphasis on safety, shippers say that both they and their carriers are very familiar with guidelines established by Occupational Safety & Health Administration, Environmental Protection Agency and Chemical Transportation Emergency Center (Chemtrec).

Department of Transportation mixing and loading rules need to be observed in order to ensure safe transportation of hazardous chemicals. This is seen as quite important in arrangements where LTL shipments are combined.

Shippers say they often aim to consolidate

their handlings by putting more than one LTL onto a truck in order to create a full truckload. Stepan Company says that it is possible to save up to 50 percent of the cost of shipping by consolidation.

Pooling arrangements, in which a central warehouse acts as a distribution center where LTL shipments may transfer from one truck to another are seen as useful in cases where expedient delivery is not essential. However, Mobay's distribution manager observes that pooling is less prevalent at the present time than it was during the energy crisis years.

Varying discounting levels are cited by producers for LTL shipments. One specialty chemical supplier says that a 20 percent discount rate is normal for good service, and that higher discount rates are offered, but "don't provide the service."

However, a flavor and aroma chemicals supplier says that a discount rate of 30 to 35 percent can be obtained "very commonly." A large resin-based chemicals producer comments that the discount level "depends on how much leverage you can exert" through frequency and quantity of business.

It is argued that deregulation of the trucking industry has created a more competitive environment that has resulted in more sizeable discounts and provided producers with an incentive to use the common carrier rather than in-house fleets for LTL deliveries.

While many agree with this, a distribution manager for Bio-Rad Laboratories says that "deregulation has had its pluses and also its disadvantages." Among the latter is the difficulty of some small carriers with staying in business. With price-cutting wars, he says, the end result could tend to be fewer companies and less competition.

Chemical suppliers say that the trucking industry has made progress in its ability to keep track of shipments. "The coding system in the industry has been updated," says Chem-Fleur Inc.'s shipping manager, with the procedure involving the assignment of a computerized number to each LTL.

"If something is lost, that number is given to the trucking company, they create a claim number and find out whether the shipment was delivered and signed for," he says. A predesignated release value is used in determining compensation for lost amounts.

Reichhold says it operates "on the exception rule — if it isn't going to be there on time, we expect them to let us know."

According to Mobay, modern technology has resulted in the use of electronic data interchange, whereby the chemical company's computer can communicate with the carrier's computer for tracing and expediting freight bills.

Producers observe that relationships with distributors are often advantageous for the handling of LTL shipments. Some companies focus on using distributors for LTL's and handle larger orders themselves. A distributor "has his own brand of customer" who may be

Continued on Page 42

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CHEMICALS SHIPPING '86

SMALL LOTS

Small-Lot Shipments: Safety Comes First

By STEPHEN KEARNEY

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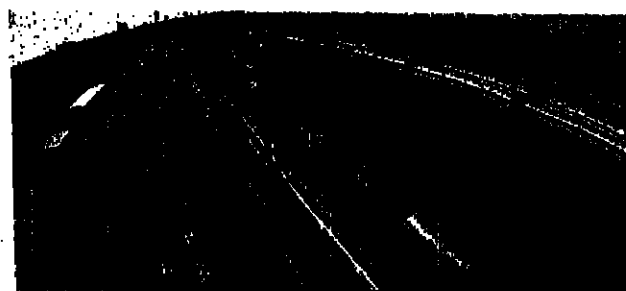
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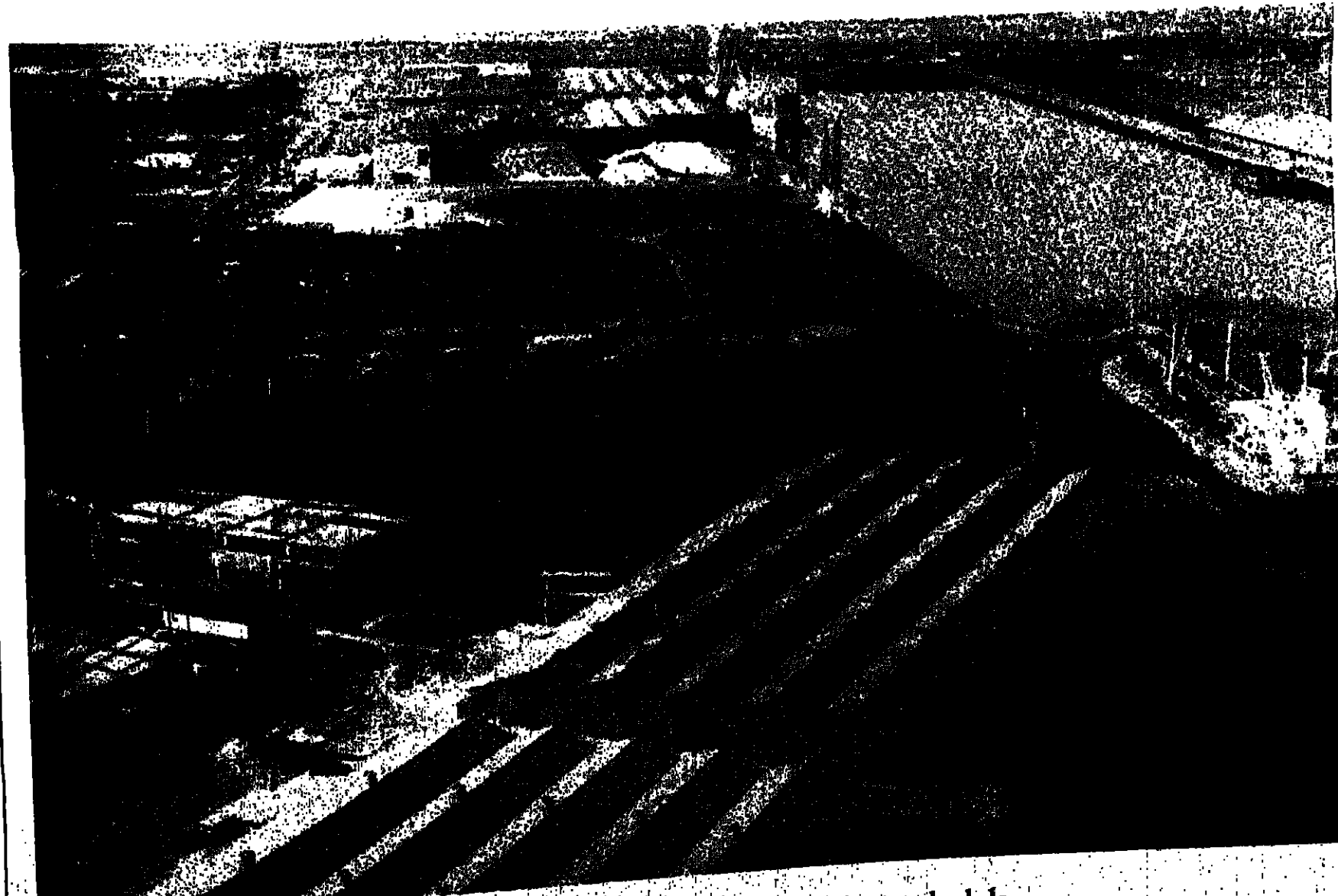


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CHEMICALS SHIPPING '86

US WATERBORNE

Chemical Barging On Way to Recovery

By MICHAEL McCOY

The chemical barging business is beginning to show signs of recovery. Those involved say that barge operating rates have been rising slowly since 1982 to the point where many barge operators now consider themselves fully operational. Some bargers say they have experienced a particular demand surge over the last three to five months.

Barge price rates have been a lot slower to pick up, however, and most involved see the lack of profitability as the major sticking point in the business today.

"We were like many other barge lines through 1980 or 1981," says Ray Greenwell, director of liquid cargo sales at American Commercial Barge Lines (ACBL). "We were doing really well, and then the crunch came — 1982 was a very bad year."

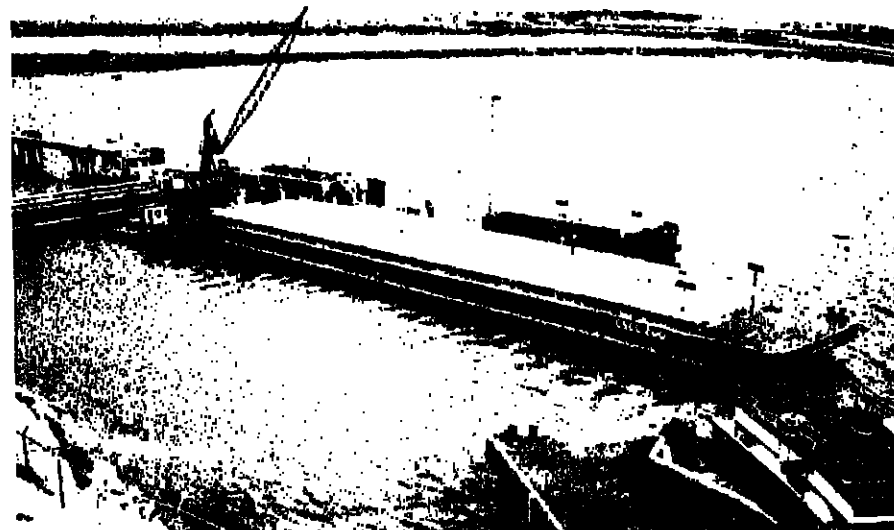
Mr. Greenwell feels that business picked

up some in 1983, then was flat in 1984. Since then, however, it has been a slow but steady rise. "Not back up to the late 1970's," he says, "but much better than four years ago."

Chuck Sweeney, director of liquid transport at Dravo-Mechling, says that over the past month or two there have been times when he actually lacked barges of certain types to send out. This is a far cry from the idle equipment levels of 30 percent experience by the industry in 1982.

Bargers are not sure what to attribute the new business to, although low petrochemical prices and the change in exchange rates are often mentioned. Mr. Sweeney guesses that the anticipated jump in oil prices may at least for the present be prompting buyers to stockpile petrochemicals while the price is right.

The transportation manager for a large chemical company notes that the last two years saw a number of chemical plant closings in the Midwest and feels the closings



CHEMICAL BARGE: Loading facilities at PPG Industries' Lake Charles, La., chemicals complex are used to ship a variety of the plant's products.

have increased barge traffic on the inland waterways.

The closing of capacity by FMC at South Charleston, W. Va., Pennwalt in Wyandotte, Mich., Dow in Midland, Mich., and Monsanto at Sauget, Ill., are examples of the Midwest chemical decline.

This observer says that similar closings at his company have prompted an increase in in-house barge shipments upriver from facilities in the Gulf to Midwest distribution points, and reasons that other companies may be doing the same. He reports that his company's plant closing has resulted in less overall tonnage shipped, but more ton-miles logged.

Another barger agrees up to a point, but adds that while a Midwest plant closing will undoubtedly increase shipments of finished products upriver, the barging of raw materials into the Midwest will likely decrease.

Whatever the reasons for the increased utilization, bargers are not quite ready to celebrate an end to bad times. Barge price rates are following neither the slow recovery experienced since 1982 nor the quick pick-up of the last few months.

In fact, barge rates, says Mr. Greenwell of ACBL, have done almost nothing since the trough of 1982. He, for one, feels that psychology has much to do with the rate stagnation. "We went down so hard (in 1982) that people

now just don't have the confidence," he says. A move to increase rates requires a lot of cautious market testing, he says, and the stakes can be very high, since business is easily lost to competitors not willing to raise prices likewise.

Mr. Greenwell feels that before the chemical barging industry can begin to increase rates, the chemical industry, especially the commodity sector, must get fully back on its feet. "I'm glad the barges are busy," he says, "but rates will take a while." Most in the industry agree, and the feeling is that significant increases are one or two years away.

'WE NEED IT'

One barge manager points out that in the late 1970's, the business had many justifications for rate increases: strong chemical demand, rising fuel costs, soaring inflation and powerful labor unions. It was easier then, he says, to stick a reasonable profit on top of all that.

Now, however, fuel costs are constant or declining, inflation is low, chemical demand is only moderate and unions are not nearly as strong. At present, there is no justification for a hike except "we need it," he explains.

An operations manager adds that in this industry an equipment oversupply situation leads almost directly to barely marginal profits. When oversupply exists, he says, the barge industry tends to run at or very close to variable costs, preferring to operate as much equipment as possible in order to spread out fixed expenses.

Given enough time, most feel rates will rise. A company leaving the business does little to change things, because another concern will always end up with the barges. Little by little, though, old barges will be taken out of service, and with little investment being made in the industry, they won't be replaced. Eventually, observers feel, supply

Continued on Page 42

CHEMICALS SHIPPING '86

CHEMICAL STORAGE

Chemical Storage Takes Turn for Better

By Ronald Begley

Overcapacity in the chemical storage industry has begun to ease, as public terminal companies benefit from an increase in the overall level of chemical trade.

Terminal operators throughout the US have seen a reduction in the oversupply of storage capacity that has been a part of the trend toward smaller inventories. Although this trend persists, there has been a noticeable resurgence of demand for storage space in the past several months.

Lee Hutchins, director of marketing and planning for GATX Terminals Corporation, Chicago, cautions that the industry has seen incremental improvement, but not a major turnaround. "Increased demand picked up the underutilized tanks," Mr. Hutchins says, "but not to the point of reducing (lease) prices or encouraging the building of new tanks."

He points out that demand for storage space is still lower than it was in the early 1980's, but that over the past twelve months the demand has grown more steady. He sees this as a function of greater stability in chemical pricing and in the chemical industry in general.

Part of the reason for the improvement has been a higher volume of import and export activity. Terminal operators have cited the increased amount of business from the Middle East in the world chemical market, as well as a flurry of gasoline imports at the beginning of this year.

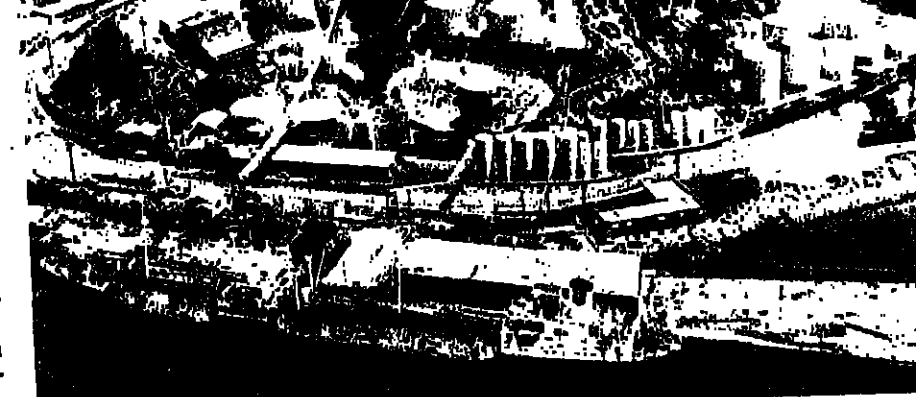
"The rush of gasoline imports early in the year helped us out significantly," says a representative of a major terminaling company. He also points out the benefits to his industry of low-priced foreign crude oil. Desirable pricing on foreign crude once compared with the domestic product led this year to an increase in imports and, consequently, greater terminal utilization. The benefits are twofold: "The low cost of raw material helps justify processing, and then the material goes through the terminal once again as finished product," the spokesman says.

The recession and high interest rates of a few years ago enabled the chemical companies to discover that maintaining large inventories is not the most cost-effective way to do business. The resulting trend toward keeping reduced levels of material has proved to be a lasting one.

Although the chemical industry is enjoying better business conditions this year, hard learned lessons have not been forgotten. Consequently, the trend in chemical storage continues to be lower inventory levels and greater demand for smaller tankage.

Dave Glover, vice-president of sales and marketing for Paktank, says that demand for 10,000 to 12,000 barrel tanks has risen greatly at his company in the past year.

Related to the trend toward smaller tanks is the rise in popularity of specialty chemicals. GATX Terminals' Mr. Hutchins says that utilization of 3,000 to 25,000 barrel tanks has increased this year at his company. Commenting on the healthiness of the chemical



CHEMICALS STORAGE: Terminal operators throughout the US report a reduction in overcapacity, thanks to an increase in the overall level of chemical trade. Pictured above is Paktank Terminals' Richmond, Calif., facility.

industry, he says, "We have seen an improvement in trade, predominantly in specialty chemicals, both in terms of import and export." He cites the lower value of the dollar abroad and the generally improved economic conditions in Europe and Japan as factors contributing to the rise in trade.

Jostein Markussen, sales manager for Baytank (Houston) Inc., says that the bulk of his company's business is specialty chemicals. "Utilization has picked up this year for us and for other companies compared to previous years," Mr. Markussen says. He notes that chemical companies still like to keep inventories low, helping the small inventory end of the terminaling industry. But, he cautions,

the improvement has not been drastic; rather, it has been slow and gradual.

People involved in the terminaling industry are generally cautious about the improvement that has occurred. As Powell Duffryn's corporate secretary, Ron Sprague, puts it, "The improvement in oversupply (of tankage) is very, very geographically specific. Generally, New York has seen improvement, but not our facilities in Chicago," he says. He cites the use of captive storage by Chicago-area chemical companies as part of the problem.

"New York is a very healthy port for our industry to be in," says Mr. Sprague, pointing out that the New York area is a "consumer

"Thanks, Dart."

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CHEMICALS SHIPPING '86

CHEMICAL STORAGE

oriented" market, concentrating on specialties and end-products rather than more basic chemicals.

Tenco Terminals' president, Garland Mendenhall, also notes that Chicago has not recovered as well as the East Coast and the Gulf. Most terminal operators in the Houston area report that they are experiencing a pick-up in utilization. The West Coast has fared better this year, trading heavily with Japan, but business has not been as steady there as it has been in the more improved East Coast.

Although chemical trade has improved this year, chemical companies have not stopped looking at ways to keep their expenses to a minimum. Their efforts to cut costs have opened up opportunities for storage terminal companies willing to expand their services.

An important service on the rise today is blending. More and more, chemical firms are looking to storage facilities for blending antifreeze and lubricating oil, as well as a growing number of specialty blends. Stricter lead controls on gasoline introduced at the beginning of this year have also opened some opportunities for blending gasoline with octane enhancers such as MTBE and toluene.

"Different suppliers are looking at how they are using their assets," says GATX Terminals' Mr. Hutchins. "Some companies have decided to invest less in some areas of production and take advantage of someone else's investment." His company is involved with blending and packaging antifreeze and lubricating oil to customer specifications. He says that this area of his company's operations has been growing in the past two years.

Mr. Sprague of Powell Duffryn has also seen an increase at his company of what he calls value-added storage, particularly in the blending of antifreeze. His company stores, blends, and packages the ingredients for the antifreeze, rather than having the clients ship the raw materials from the storage facility to a separate contractor's site for packaging. "Our customer savings on intermediate transportation are tremendous," says Mr. Sprague. He notes also that the greater emphasis on cost reduction in the chemical industry will bring a continuing rise in demand for expanded terminal services of this kind.

In addition to looking for expanded services, chemical firms are also scrutinizing the insurance coverage of for-hire storage terminals. Terminal operators are finding more and more inquiries made by prospective clients regarding their coverage. As chemical values rise, the chemical industry finds itself more concerned about the safety of their investment and the quality of the services they are receiving.

The storage industry is facing higher insurance rates and, more importantly for some, they are finding it more difficult to even receive coverage. Firms with large asset bases and long histories of few or no claims are faring better in the insurance market.

Tank companies are also conducting more frequent operational checks to reduce the likelihood of claims. This situation, as well as the more stringent enforcement of Federal safety and environmental regulations experienced this year, result in greater expense, largely in terms of upgrading older tank facilities to bring them into compliance with requirements of both the government and the insurance companies.

The combination of stabilization and cautious spending in the chemical industry will mean more business for those terminal operations which can accommodate the growing demand for storage of specialty chemicals, smaller capacity tanks and expanded services.

Chemical Barging

Continued from Page 40

and demand will balance and rates will increase.

In the meantime, poor returns have taken their toll. The past two years have seen a number of acquisitions. In December 1984 Ingram Industries bought Ohio Barge from United States Steel Corporation; in January 1985, Ohio River Company acquired Federal Barge Lines; and in July of this year, National Marine sold its chemical and petroleum products barge business.

As one barger sums up the acquisition boom, "One company sees an inadequate return on investment and another sees bargain hunting and long-term prospects."

Although barging is almost universally acknowledged to be the cheapest way to ship bulk commodity chemicals inland, some in the business are noticing a significant decline in the specialty chemical area.

Ron Key of the Lake River Corporation, a storage and distribution business near Chicago, says that over the last five years he has witnessed a substantial pickup in shipment by rail to his terminal, at the expense of barge traffic. Lake River deals largely with specialty-type items.

He attributes the shift mainly to better inventory control on the part of producers. He feels the slump of 1982 taught companies to operate with lower, better managed inventories, and that the quicker shipments and better timing the rail business provides is conducive to this new mentality.

Mr. Key believes specialty chemical companies are enjoying lower storage and insurance costs as well as a more tightly run businesses as a result of smaller inventories. Although his is only one terminal of many, he says that by 1989, "most of my customers want to be on a rail delivery system."

While the barge industry is not generally known for innovation, new ideas put into action by companies like Stolt-Nielsen Inc. may help to reverse the trend that terminal operators like Mr. Key have noted.

Stolt-Nielsen can arrange shipment by a fleet of "parcel-barges," vessels containing up to eight individual and isolated liquid cargo parcels. Many of these barges are equipped with individual pump systems for each parcel. Parcels can hold anywhere from 200 to 2,000 tons of liquid.

Looking at the legislative front, one major bill, the Water Resources Development Act, is poised to affect the industry. According to Jeffrey Smith, spokesman for the American Waterway Operators, an industry organization, the bill has passed through the House and Senate and is now in conference, where a final version will be hammered out.

Mr. Smith says the major difference between the two versions is in the fuel tax. The House version requires no increase while the Senate is looking to double the 10-cent-per-gallon tax.

American Waterway Operators would like to see an implementation delay of a few years, which would allow the industry a

chance to recover more fully. Then an incremental increase of one or two cents per year is desired. Funds raised will go mostly to the construction and repair of major waterway docks and dams.

The Tennessee-Tombigbee waterway, opened to traffic in January 1985, continues to get reviews from its operators, barge owners and businesses that it services. Don Waldon, administrator of the waterway, says that it has moved more tonnage in the first six months of 1986 than in all of last year.

Chemicals are one of the major product areas for the Tenn-Tom, with caustic soda and ammonia listed as two big-volume items. Mr. Waldon noted that the opening of the waterway has prompted chemical plant expansion along its service area.

Over the past year, American Colloid, Kerr-McGee and Degussa have all announced plant expansions in the area and all have mentioned the waterway as influencing the decision.

Other waterways have also benefited as a result of the Tenn-Tom. Mr. Waldon says a common practice of bargers is to move tonnage North on the slack water of the Tenn-Tom and then coast back South downstream on the Mississippi.

Small-Lot Shipments

Continued from Page 38

difficult to gain access to without him, observes Reichhold's distribution spokesman.

Carrier company use of piggybacking on railroad lines is described as a method of operation that is beneficial to LTL suppliers in some cases. "Piggybacking is attractive, especially between Chicago and the West Coast, where everybody is running stacked trains," says Stepan.

However, the situation would be more attractive if the service were more regular. Only one line, Santa Fe, has piggybacking every day.

For small shipments, air freight is a frequently chosen method of delivery. One pharmaceutical chemical supplier says that better than 50 percent of its material travels via United Parcel Service (UPS) or Federal Express.

One producer says that, in a highly competitive area, such as pharmaceutical chemicals, the speed of air delivery is important in enabling a company to "keep our business, based on service."

Air carriers have varying levels of service, depending on the shipper's needs. Squibb Corporation says that UPS is able to deliver 90 percent of its shipments within two days. Bio-Rad Laboratories points out that air carriers are capable of generating invoices by computer, leading to additional savings of time and cost.

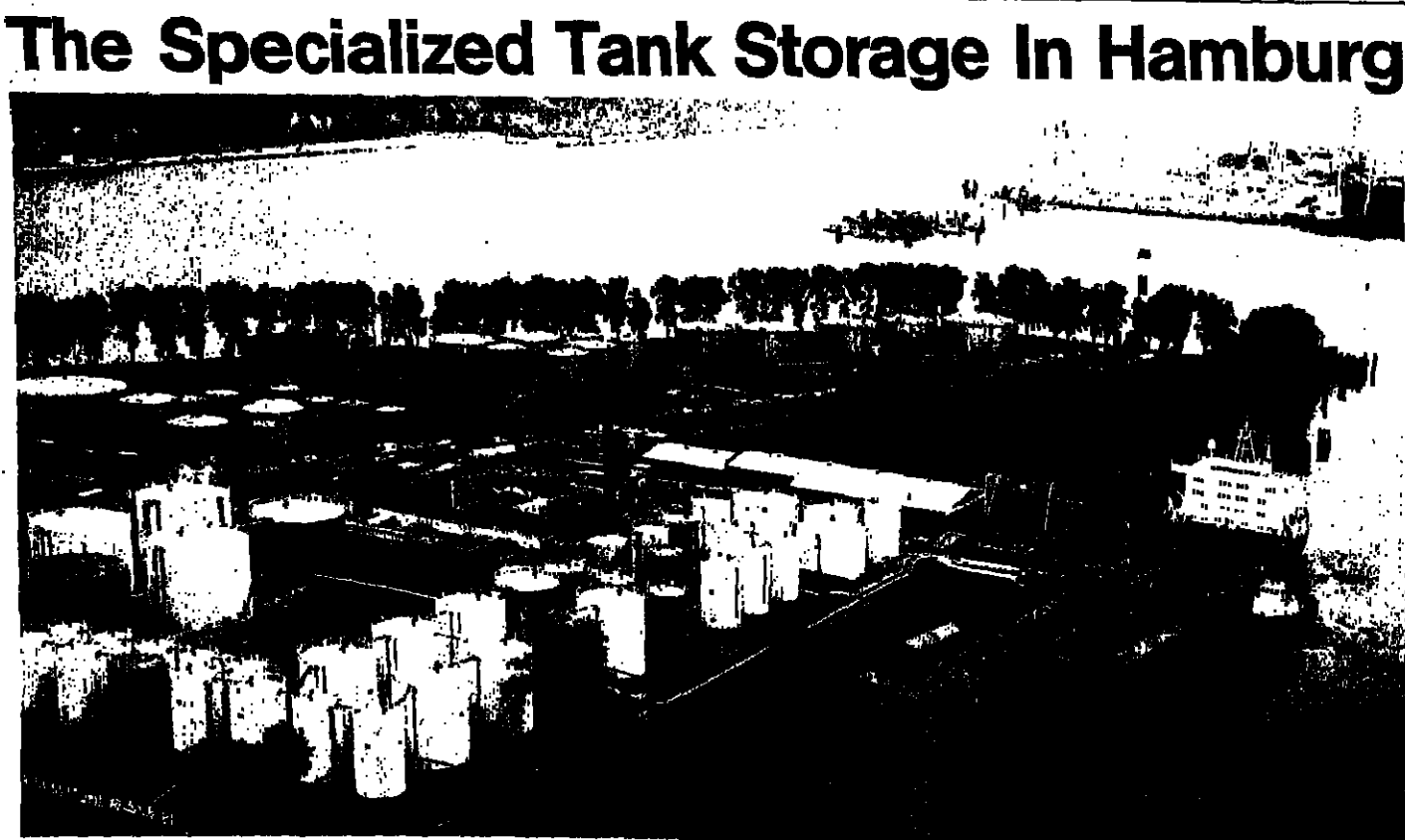
Chem-Flour, Inc. observes that, with small shipments, it is important to use standard packaging sizes.

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Pollution Regulations

Continued from Page 34

skeptical about the viability of commercial operators dealing with waste without the help of government finance.

A waste disposal facility will be run by a private company, Tank Cleaning Rotterdam, which already operates one for dealing with oil wastes and some petrochemical residues. But the new installation, which will have water treatment equipment and will be completed in 1988, is being funded through a \$7 million government grant.

"It would have been impossible to do it without a government subsidy," Mattyeu Heynen, head of the port authority's environmental department, says.

Annex II will result in port charges in Europe, already distorted by government subsidies, showing an even greater imbalance. Even the subsidized Hamburg port authority has warned that its fees for waste disposal are likely to be considerably higher than Rotterdam's.

The Dutch port has acted quickly to ensure that it does not become a dumping ground for chemical waste throughout Northern Europe. It has brought in a by-law restricting access to its waste disposal equipment only to ships unloading cargo in the port.

"We're not going to have ships on route from Antwerp to Hamburg calling in here on the way to offload their slops," says Mr. Heynen.

Some port authorities, who will have the duty to enforce Annex II, are likely to be less strict than others.

The German and Dutch authorities, under pressure from strong domestic environmental lobbies, will be adhering rigidly to the regulations, which in turn could cause some friction.

"How long are chemical companies going to tolerate having to pay \$2 extra per tonne in one country for dealing with slops while in another they have to pay little or nothing because it is taking no notice of the rules?" asks Mr. Flotron of Eccto.

Annex II should mean that cargo rates which have remained flat since the early '80's because of excessive overcapacity will start to rise.

"In theory, rates must go up because of the additional port costs but it is difficult to predict by how much," says Patrick Kelly of London shipbrokers, General Chemical Chartering.

One shipping company official thought that the rise in rates could be less than 10 percent. "Overall, the extra cost should be fairly marginal because the materials involved are very expensive products," he says.

Nonetheless, the new rules could change the pattern of rate levels, which so far this year in most chemical sectors have remained stubbornly low.

Ship owners had been hoping that the sharp drop in the oil price earlier in the year would help the chemical shipping market. Some chemical tankers have moved into the market for clean or refined products as a result of the increase in trade, leaving less competition at the lower end of the chemical sector.

"Though it is moving in the right direction, the chemical market is still not in balance," says Mr. Sharp of Gotaas-Larsen.

European shipping companies also feel less threatened by the Japanese, whose ships were posing a big danger last year when they started to take on trade both to and from Europe and in the region itself.

"At the moment they seem to be confined to the Far East/Europe route because the

rise of the yen has brought a surge of exports to Japan," observed Mr. Flotron.

Ship owners also believe that prospects have been brightened by a fall in the number of new chemical carriers being built. "If a drop in the number of ships coming out of the ship yards can be combined with growth in chemical consumption, then there is cause for some optimism," says an official at JO Tankers, the Norway-based pool of parcel carriers owned by J.O. Odell of Norway and Johnson Lines of Sweden.

The big hope is however that Annex II will take a significant proportion of older ships out of the market on the grounds that it would be uneconomic to invest in their upgrading. Eccto estimates that 80 percent of vessels of its member companies have or will be refitted.

A withdrawal of even a small percentage of carriers from the market for more expensive cargoes could make all the difference to rates, it is felt.

"Ship owners have been obediently following the IMO regulations so it is only fair that they should be honored by rates which give them a return on their investment," says Mr. Bouwers of Gebr. Broere. "I sincerely hope that the rules will result in a drop of overall capacity."

ness, he has found that the private fleet can respond immediately to changing circumstances, such as weather, a primary variable in the construction business.

Crews can be moved to job sites immediately when private trucks are used. His division does not handle hazardous materials, concentrating on large-volume shipments of unreactive chemicals, ores, and building materials such as vermiculite.

David Seargeant, director of safety security for Grace's Distribution Services Division, provides similar support for continued use of in-house fleets — his division, which deals with hazardous and reactive chemicals, tries wherever possible to handle trucking needs internally. It also has common carrier authority for other divisions of the company.

Use of intermodal transport is expected by some transportation managers to grow exponentially. One firm, which used 100 piggybacks per year before deregulation, expects to use up to 3,000 piggybacks next year.

American President Lines has streamlined its ship-to-rail-to-truck transport chains, eliminating empty backloads for international steamers, which now carry domestic loads from West Coast ports on their way back from trips to the Far East.

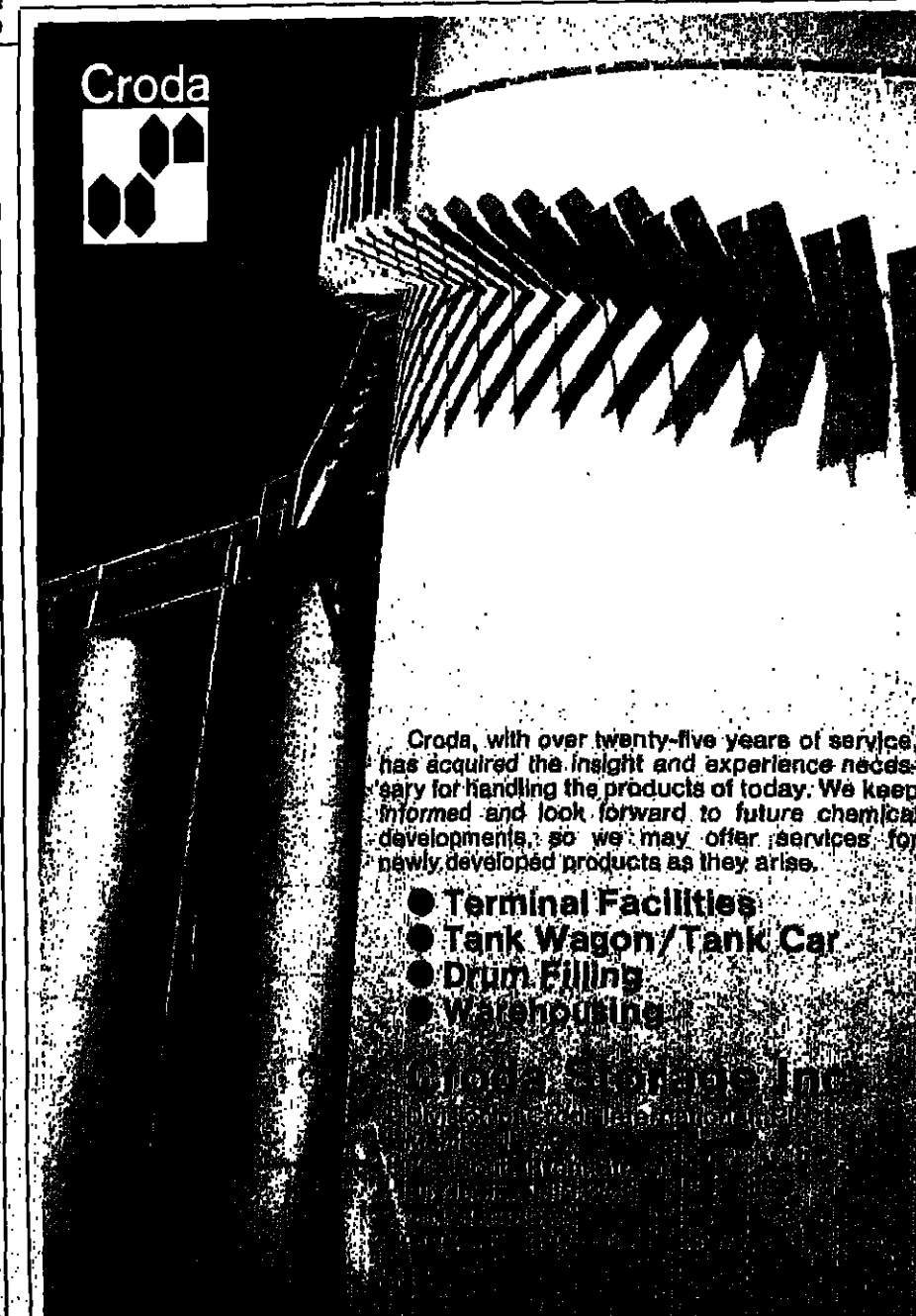
Common Carriers

Continued from Page 37

Hansen, the general manager of the Construction Products Division, reports that total tonnage is evenly divided between truck and rail. Sixty percent of the total truck volume is handled by outside carriers, with the remainder covered by the division's fleet.

Given the spontaneous nature of the busi-

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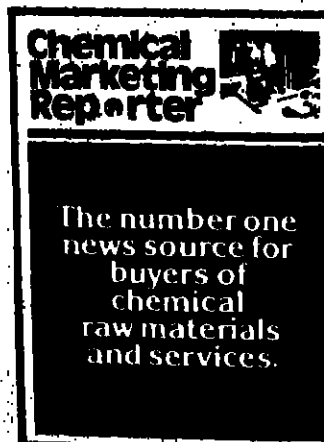
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COATINGS & PLASTICS

PVC Producers Scheduling Price Increases for October 1

Most major producers of polyvinyl chloride are attempting to reinstitute the failed June price increase of 2 cents per pound, citing rising raw material costs and strong demand.

Shintech Inc. and Air Products & Chemicals Inc. are raising selling prices for pipe, general purpose, specialty and film grades of PVC to 30 cents, 31 cents, 32 cents and 33 cents per pound, respectively. The increases are effective October 1.

B.F. Goodrich, the largest domestic producer of the resin, is giving customers a 1-cent-per-pound TVA for the month of October, but plans to implement the full increase by November.

Formosa Plastics Inc.'s line of PVC products will sell at 29 cents per pound for pipe grade and 30 cents per pound for general purpose grade, effective October 1.

As of late last week, Vista Chemical Company, another major PVC producer, had made no moves of its own.

The June increase was an attempt by producers to move PVC prices back up to April levels. The initiative was successful at first, but prices gradually eroded over the Summer to pre-increase levels.

In addition to the effect of rising ethylene prices on VCM production costs, PVC producers note that merchant supplies of vinyl chloride monomer have tightened as a result of rising export volumes.

DOMESTIC DEMAND RISING
Domestic PVC demand, meanwhile, has exceeded producers' expectations. Construction-related end-use markets have been very strong this year, let by the pipe and siding portions of the extrusion business.

Conservative growth estimates for the total PVC market this year range from 5 to 7 percent, pushed by construction-related market segments.

In response to increased demand, operating rates have been high this year, with most producers stating that between 90 and 95 percent of a current total effective capacity of 1.5 billion pounds is being used. Margins will have to improve, producers warn, if they are to maintain current production rates and absorb increases in raw material costs.

Through June of this year, the total domestic PVC market grew almost 10 percent over last year's figure, to roughly 3.6 billion pounds.

Extrusion demand was up 5.5 percent over this time period, moving to 2.3 billion pounds. Within that segment, siding demand shot up 9.1 percent to 244 million pounds, and tubing and rigid pipe grew 6.7 percent to almost 1.5 billion pounds.

Though it is still a relatively small portion of the total market, dwarfed by the extrusion segment, molding showed 7.1 percent growth, totalling 251 million pounds in the first six months of 1986.

Producers involved with the bottle blow molding business expect it to grow between 8 and 12 percent annually through 1990. While PET is expected to corner the soft drink packaging market, producers feel that PVC

blow molded bottles will find secure niches in both edible and non-edible bottling applications. They are currently used for bottling spring water and vegetable oil, as well as in pharmaceutical, household cleanser and laundry detergent packaging.

Producers expect this to become a more

PRICES TRENDLINES

WEEK ENDING SEPT. 19, 1986

CHANGES/UP

None

CHANGES/DOWN

None

COATINGS INDEX

The Coatings & Plastics index reflects the prices of 13 representative materials in this sector and the quantity of each produced in 1985.

Sept. 19, 1986	308.4
Sept. 12, 1986	308.4
Sept. 20, 1986	308.4
Sept. 23, 1985	308.4

Chemical Prices Start on Page 52

important market segment in the future. Shintech, though it will continue to produce its own lines of bottle-grade resin, will be starting a domestic subsidiary specializing in PVC bottle grade resin manufacture for use in food and non-food packaging.

This subsidiary, K-Bin Inc., is scheduled to start up in December of 1986, and should initially add another 20 million pounds per year of capacity to a total bottle grade PVC capacity of 200 million pounds.

Compound sales jumped 221 percent through June of this year, to 139 million pounds, including flexible and rigid. Producers say that the flexible compound sales fell slightly since July, but expects the segment to continue to show strength.

PVC exports shot up 17.5 percent through June, to 185 million pounds. Producers say much of this is attributable to a weaker US dollar/yen ratio, and supply displacements in the Far East. They are not sure whether this represents a trend toward a heightened US presence in the world PVC market, or simply reflects fluctuations in the economy. It has been a welcome surprise, given low export volumes last year, when exports fell 22 percent to 310 million pounds, and a stronger dollar brought in a flood of imported low-end commodity material.

Supplies are said to be tight, although high production rates are keeping them adequate. Inventory levels, which fell sharply during the second quarter, in response to VCM supply problems, continue to be low.

PLASTICS MATERIALS

PHENOLIC RESINS — Producers report that selling prices for phenolic resins this year fell 10 percent by the second quarter.

PLASTIC RESIN SALES & OUTPUT: JUNE

SPI'S COMMITTEE ON RESIN STATISTICS REPORTS.

	SALES AND USE (1,000 LBS)		PRODUCTION (1,000 LBS)	
	1986	1985	1986	1985
THERMOSETTING RESINS:				
Epoxy resins (unmodified)	31,212	33,673	38,702	27,548
Urea resins	138,676	102,697	130,720	103,710
Polyester resins	113,277	104,788	114,048	104,628
Phenolic and other tar acid resins	232,488	222,951	232,805	222,586
Alkyd resins	16,216	16,949	16,949	16,949
THERMOPLASTIC RESINS:				
Acrylonitrile Butadiene Styrene (ABS)	88,785	87,033	88,085	85,891
Polyvinyl alcohol	N/A	11,881	N/A	6,398
Polyvinyl chloride	517,804	507,888	510,070	540,598
Polyethylene (density above 0.940)	517,472	540,578	567,125	568,078
Polyethylene (density below 0.940)	738,088	844,302	733,631	726,412
Polypropylene	480,889	485,135	483,489	483,384
Styrene-acrylonitrile (SAN)	6,252	7,241	6,252	7,711
Polyethylene (total)	402,466	399,386	399,655	344,464

LONZA

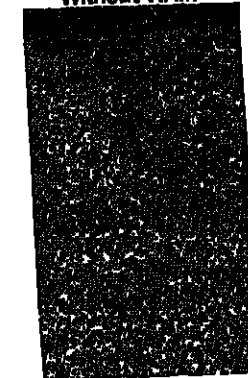
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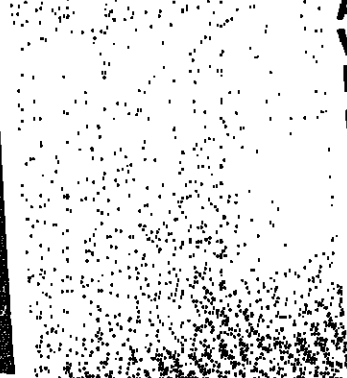
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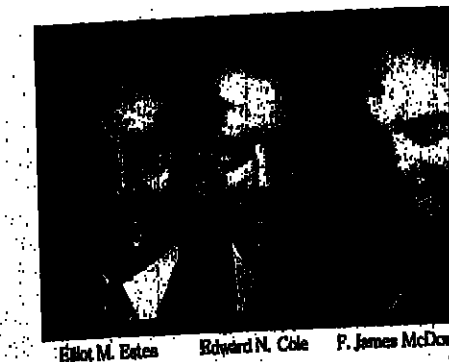
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September 22, 1986

COATINGS & PLASTICS

mostly in response to depressed phenol prices and foreign competition. There has been no real change in prices since then.

Although major phenol producers announced a 2c. per pound increase to be effective by the third quarter, it did not hold.

Although selling prices are hard to pin down, considering the variety of grades within each category, one source says that high-volume selling prices for commodity liquid phenolic resins grades are currently in the low 30c. per pound range.

Semi-solid types (60 percent solid content) sell for 30c. per pound; specially pulverized solid grades are selling in the 70c. to 80c. per pound range.

While demand for phenolic resins was up almost 7 percent in the first half of this year to 1.4 billion pounds, producers expect a falloff in the second half. For the year as a whole, demand is expected to be the same, or

slightly below, last year's level of 2.6 billion pounds.

Capacity utilization is estimated to be around 75 percent of total nameplate. In June, Reichhold Chemicals sold its phenolic resins division to BTL Specialty Resins, a division of BTL Industries, formerly Bakelite Ltd. of Canada; the firm is not planning any changes at this time although a rationalization study is underway. Georgia-Pacific plans to expand its Beaver Creek facility by the end of the year.

POLYESTER RESINS — Reichhold Chemicals Inc., a major producer of unsaturated polyester resins, will be hiking selling prices for its lines of the resins, effective October 1.

Selling prices for general purpose unsaturated polyester resins will be increased 2c. per pound for all shipments on and after October 1.

Specialty resin grade prices will be raised in varying amounts, depending on grade and volume of purchase.

Prices for polyester resins, following

lower demand, fell 5 percent over the course of 1985. Driven by low crude oil values, lower demand and overcapacity they fell an additional 7 percent by the end of April, 1986 (CMR, 4/28/86, pg. 23). By the end of the second quarter, they were a total of 10 to 12 percent lower than they had been in second quarter 1985 (CMR 6/25/86, pg. 29).

Customer demands for pass-throughs of lower crude oil costs had been a primary motivating factor, despite the fact that costs for several key ingredients dependent on natural gas, rather than crude values had remained stable.

Producers hope that this same customer psychology may now work in their favor, as styrene monomer price hikes and higher glycol costs may lead to a more receptive environment for a price increase.

One producer reports that styrene monomer supplies have been very tight lately, as scheduled turnarounds and operational problems have developed for some plants, further contributing to the need to raise polyester prices.

By mid-August, selling prices were said to

have firmed somewhat (CMR 8/25/86, pg. 30).

POLYETHYLENE — Dow Chemical Company will be raising list prices for its "Dowlex" lines of specialty extrusion-castable linear-low and medium-density polyethylene for the first time in the low years since these products were introduced.

The company is increasing prices for less-than-truckload quantities, effective October 1.

Volumes of 25,000, 10,000 and 1,000 pounds of "Dowlex 3010" will sell for 59c., 61c. and 65c. per pound, respectively. Prices for similar volumes of "Dowlex 3030" will be 62c. per pound, 64c. per pound, and 68c. per pound, respectively.

PRIME PIGMENTS

ANTIMONY OXIDE — Effective September 12, Asarco Inc. lowered list prices for its antimony oxide products by 5c. per pound. New prices for its high and ultra-high tin, low tin, and ultra-pure grades are \$1.35 per pound, \$1.40 per pound, and \$1.50 per pound, respectively.

Other domestic producers feel that this move is unrelated to overall market conditions, and speculate that it must be due to excess inventory. This is the third time, Asarco has changed antimony oxide prices this year.

TITANIUM OXIDE — Kemira Oy, Inc. will be raising list prices for its lines of rutile and anatase titanium oxide, effective October 1.

This follows price increase announcements by virtually all domestic producers and distributors of the pigment. Earlier, SCM and Du Pont announced increases (CMR 9/1/86, pg. 33). They were followed by Rohm-Chem and Kerr-McGee Inc. (CMR 9/8/86, pg. 35). National Lead Industries initiated this move to increase prices in the second quarter of this year (CMR 6/21/86, pg. 29).

Kemira's rutile grades have been hiked 3c. per pound, and will now sell for 81c. per pound. Its water-dispersible anatase grades have been increased 5c. per pound to 78c. per pound, and its treated anatase grades by 4c. per pound, to 84c. per pound.

Although the company continues to import material from its parent company in Finland, its Savannah, Ga., plant, acquired from American Cyanamid, is said to be running at full capacity. Operational expansions are planned, but are still in the proposal phase. Like all producers involved in this market, the firm is said to be running at close to full capacity both here and abroad to keep up with demand.

ZINC OXIDE — St. Joe's Minerals Company and Pacific Smelting Company have both followed New Jersey Zinc Company's move to increase zinc oxide prices, effective October 1.

On September 11, St. Joe Minerals announced its plans to raise list prices for its zinc oxide products by 3c. per pound. New prices for its French process grades 500 and 900 will be 52c. per pound and 53½c. per pound, respectively.

Last Tuesday, Pacific Smelting said it will be hiking prices for its activated and French-process grade products by 5c. per pound. Its activated grade will now sell for 54c. per pound, its French-process grade for 55½c. per pound.

These firms explain that recent dramatic increases in zinc metal prices provided the major impetus for the price change. Where, in the first quarter of this year, they ranged near 30c. per pound, they steadily increased, shooting up dramatically within the past two months to 47c. per pound.

Demand for zinc oxide is expected to equal last year's figure, but not surpass it. Last year was a good year for this mature market.

MISCELLANEOUS

SILICA PRODUCTS — Following Du Pont's move, PQ Corporation will be raising list and selling prices for its "Nyacol" line of colloidal silicas.

Effective October 6, the list price for "Nyacol 9950," a paper-frictionizing agent, will be increased 8.5 percent to 84.6c. per pound, bulk and 79.3c. per pound truckload.

Prices for the company's other "Nyacol" lines, will be raised 7 percent, effective the same date.

New list prices for bulk and truckload quantities of its investment production casting grade "Nyacol 830" will be 43c. per pound and 48c. per pound, respectively.

HEAVY & AG CHEMICALS

Aluminum Chloride Makers See Gradual Market Turnaround

North American anhydrous aluminum chloride producers are optimistic that the industry is turning around after years of shrinking demand and soft pricing, although there could be more trouble down the road.

Demand for aluminum chloride was either flat or down during most of the early 1980's. The demand slide, producers say, came primarily because many makers of ethylbenzene, the styrene precursor, moved away from aluminum chloride-catalyzed production. Similarly, some chloride process titanium dioxide capacity has switched to non-aluminum chloride based processing.

Demand shrinkage has had its impact on the market's players. In early 1984, Vanchlor Company bought ACL Industries of Elkton, Md., and moved the equipment to its Lockport, N.Y., location. Much of the capacity was closed permanently, according to Vanchlor.

Similarly, in early 1985, Welland Chemical in Sarnia, Ontario, bought DAL Specialties, Ramonville, N.Y., and shut down that facility. The market now stands at three commercially active players, with Argus Division of Wilco Corporation being the third and largest producer, at LaPorte, Tex., and Phillipsburg, N.J.

With the size of the business now pared down, producers say that demand is looking up. The most optimistic marketer feels 1986 growth will be between 2 and 3 percent; another considers this year to be about even with 1985 but sees new applications on the horizon.

Any increased demand is linked mostly to growth in the titanium dioxide and styrene industries. Government figures show that US titanium dioxide production through June 1986 is up over 12 percent, compared to the same period last year. Styrene production is also up, by almost 2 percent.

HIGH OPERATING RATES

Moreover, at least one aluminum chloride marketer feels high operating rates for both these products will ensure that no additional production changes precluding aluminum chloride use will take place for another year or two.

Also cited as significant but smaller volume growth areas are catalytic uses in the pharmaceutical and specialty chemical markets.

Pricing, producers say, is the main sticking point today, with the business "running on very thin margins" according to one.

The April 1 price increase of 3.5 cents per pound is generally regarded to have succeeded. The hike, however, was not much more than a raw material price passalong, producers claim.

Price histories for aluminum and chlorine, the product's two raw materials, back this contention up. Aluminum prices, according to one analyst, are on the average about 8 cents per pound higher this year as compared to last. Similarly, chlorine prices have increased over \$20 per ton since the beginning of the year.

Aluminum chloride prices are close to but not quite at list levels. Bulk shipment prices list at 48 cents per pound, f.o.b. plant, but are said to be selling between 43 and 47 cents per pound. The list price for drummed material is 52 cents per pound; selling prices are discounted here as well.

Current capacity in the industry is listed as close to 55 million pounds, with US demand estimated between 44 and 48 million pounds.

One producer notes, though, that a good amount of listed capacity may actually be non-functional at present. He feels that three or four years of shrinking demand has resulted in production reactors that are potentially operational but currently idle. Consequently, he considers supply and demand to be in a good balance at present.

A significant addition to the capacity picture, however, is on the horizon: After years

of false starts, Toth Aluminum Company of Metairie, La., is coming on stream with up to 20 million pounds of aluminum chloride capacity. The Toth product is manufactured by a proprietary process involving reaction of chlorine with aluminum-rich clays.

According to Toth, the company's first aluminum chloride sale was to Grant Chemical, a division of Ferro Corporation in nearby

PRICES TRENDLINES

WEEK ENDING SEPT. 19, 1986

CHANGES/UP

Zinc (export), \$46 per ton

CHANGES/DOWN

None

HEAVY & AG INDEX

The Heavy & Ag Chemicals index reflects the prices of 18 representative materials in this sector and the quantity of each produced in 1985.

Sept. 19, 1986	113.69
Sept. 12, 1986	113.69
Aug. 22, 1986	113.69
Sept. 20, 1985	113.69

Chemical Prices Start on Page 52

Baton Rouge. Grant has completed trial test runs and has found the product comparable to and price competitive with traditional material, Toth claims. Moreover, Toth says it is negotiating sales to several companies with a combined annual usage of 2 million pounds.

Toth still has a distance to go, however. The plant is currently operating on a batch process schedule, since some equipment is common to both the chlorination and purification steps. A spokesman says the company plans to be on a continuous process soon, although no definite date has been set for the modification.

The Toth facility also makes silicon tetrachloride, on almost a one-to-one basis. One source notes the difficulty of marketing co-products, especially, he says, in an area as slow as the silicon tetrachloride market.

Another producer points out that while aluminum chloride is a relatively simple compound, the variety of different screen sizes and iron content levels available adds up to almost 50 different products overall. Customer and technical services for the product's wide range of catalyst and specialty applications are also important, he says.

Two world producers are also present in the US market to a lesser degree. Pigmentos y Oxidos makes aluminum chloride in Monterrey, Mexico. Southern Texas Chemical, which markets the product here, says it is imported in limited amounts.

Also, Fluka Chemical Corporation imports a low-iron reagent grade aluminum chloride from its parent company in Switzerland. The material is used in research and development applications, mainly in Friedel-Crafts reactions, and also in the production of sophisticated battery systems, according to the company. Argus Division of Wilco Corporation also makes a reagent grade.

ALUMINUM SULFATE — Essex Industrial Chemicals notes that it has sent customers letters announcing the removal of TVA on the price of dry, standard ground aluminum sulfate. The new prices, effective immediately, are \$205 per ton to distributors and \$220 per ton to direct consumers, both f.o.b. distribution point.

Essex joins General Chemical and Stauffer Chemical (CMR, 9/8/86, pg. 31) in announcing dry alum price changes. The distributor price had recently been lowered to \$185 per ton (CMR, 4/28/86, pg. 25) in response to the

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MAGOX® Sugar Grade MAGOX® 98 MAGOX® 90 MAGOX® Slurry	Sugar Refining	Neutralization of raw cane and beet sugar juices reduces evaporator scaling.
MAGOX® 98 MAGOX® 95 MAGOX® 90 MAGOX® Slurry	Waste Water Neutralization	MgO is a safer, more cost-effective acid neutralizing agent than other bases.
MAGOX® 98 MAGOX® 95 MAGOX® Slurry	Pulp and Paper	Used in the production of magnesium bisulfite pulping liquors.
MAGOX® 98 MAGOX® 90	Drilling Muds	Used as a buffer, corrosion inhibitor and viscosity control ingredient.
MAGOX® 98 MAGOX® 95	Rayon	To make Mg acetate which is used in cellulose acetate production.
MAGOX® 98 MAGOX® 95 MAGOX® 90	Water Treatment	Silica and heavy metal removal.
MAGOX® Ag Grade MAGOX® 98 MAGOX® Slurry	Fertilizer	Supplementation in Mg deficient soils for such crops as citrus, tobacco, hay, potatoes, corn, vegetables, fruits and nuts.
MAGOX 98HIF MAGOX® Premium Grade	Neoprene and other Elastomers	Highly reactive MgO for use in hoses, belts, gaskets and other automotive and mechanical products.
MAGOX® 98 MAGOX® 90 MAGOX® 95 MAGNESITE 33	Miscellaneous	Magnesia is used as an adsorbent, flocculent, filler, to make phenolic resins, to precipitate heavy metals from plant effluent and for insulation. Also used in the production of oil additives, and anti-corrosive coatings.

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HEAVY CHEMICALS

threat of import material from the Caribbean.

CAUSTIC SODA — Holtrachem Inc., a major distributor of caustic soda, has announced an increase in the price of its caustic soda solution, effective immediately and as contracts permit, on a case-by-case basis.

As reason for the increase, Holtrachem notes that caustic soda producers have increased prices and that a significant amount of chloralkali has been recently rationalized by Dow Chemical at Freeport, Tex., and Du Pont at Corpus Christi, Tex. The company also points out that Occidental Chemical's recent acquisition of Diamond-Shamrock's chloralkali business has eliminated one player from the marketplace.

Holtrachem feels that producer invento-

ries of caustic soda are in better balance than they were earlier in the year. Inventory pressure should not be a problem in the near future, the company believes, because the construction industry has peaked for the year, and chlorine demand should decline as new building slacks off. Slowdown in the decline of interest rates should also dampen new construction, the company says.

According to Holtrachem, now that oil prices are no longer declining, and may now be bumping upward, inflation should be picking up, resulting in the usual slowdown in business that affects chlorine before caustic soda.

SULFUR DIOXIDE — Essex Industrial Chemicals says it has sent letters to customers notifying them of a \$10 per ton increase in the price of sulfur dioxide. The new price is \$230 per ton, f.o.b. plant, and is effective immediately, or as contracts permit.

Essex joins most other major marketers raising sulfur dioxide prices.

ZINC — Falconbridge Ltd. said last week that effective immediately, for sales outside North America, the base selling price for "Kidd Creek" brand zinc metal has been increased to \$920 (US) per ton from \$880 (US) per metric ton. Falconbridge produces zinc at its Timmins, Ontario, metallurgical site.

Fluorocarbon Group

Continued from Page 3

coordination of international scientific research on the ozone depletion theory; and the avoidance of further unilateral regulation by the US or regulation of specific CFC uses.

Mr. Barnett emphasizes that international cooperation is vital because the US accounts for only one-third of CFC production capacity in the free world. The quantity of CFC output by Eastern Bloc nations is unknown, he adds.

He says the policy statement is consistent with the approach taken by the European Economic Community.

CFC's are utilized in numerous products and uses, including air conditioning and refrigeration systems. The annual value of goods and services which depend to a varying degree upon CFC's exceeds \$28 billion, and more than 780,000 US jobs are related to CFC uses.

The major US producers are Du Pont, Allied, Pennwalt, Kaiser and Racal.

Environmental groups hailed the alliance's statement as a step forward. "I welcome their recognition that it is an issue requiring international cooperation," says Irving Mintzer, an ozone specialist for the World Resources Institute. "There are some real positive aspects to this."

EPA also lauded the group's announcement. "It's a significant shift from their position that science doesn't tell you anything," says agency spokesman Christian Rice.

Sulfur Removal Unit Starts in Michigan

Michigan Gas Processors Company, Traverse City, Mich. has fully brought on stream a 14-long-ton-per-day sulfur extraction plant at its Manistee gas plant. The facility uses the at its Manistee gas plant. The facility uses the autocirculation "Lo-Cat" hydrogen sulfide oxidation process, designed by ARI Technologies, Inc., Chicago, Ill. The unit is capable of extracting all of the hydrogen sulfide and mercaptans found in natural gas wells, according to ARI.

The "Lo-Cat" process starts with hydrogen sulfide and carbon dioxide being removed from the natural gas after treatment with Union Carbide's "Ucarcol" LE-701, an amine capable of separating the two gases from the main gas flow. The H₂S and CO₂ or acid gas, is then reacted with a chelated iron solution that breaks the hydrogen sulfide down to elemental sulfur and water. Carbon dioxide is vented into the atmosphere.

ARI says the process is currently competitive with the widely-used Claus method of sulfur removal in small gas flows. It is also useful as a secondary treatment system for separating hydrogen sulfide not removed by other processes. It is being used by Michigan Gas Processors, ARI says, because the process is able to upgrade sour gas found in Michigan and purify it enough to meet the pipeline specifications of Michigan Consolidated Gas Company.

PERFUMES & FLAVORS

Continued from Page 28

"some allowed large portions of the crop to rot on the trees," he says.

Since the dollar has weakened, however, the Calabrian growers have regained interest. Now a smaller harvest, 80 tons for 1985 compared to a yearly average of 110 to 120 tons, coincides with climbing prices. "The quantity of the new crop bergamot oil should be up," says a broker.

PETITGRAIN OIL — Petitgrain oil prices remain at \$8.75 per kilo; the same price it has had for the past ten years, according to one trade source. "It is a very low price," he says, "and remains there because the Paraguayans, the main producers, are trying to prevent the introduction of synthetics into the market." Linalyl acetate and linalool are both aroma chemical substitutes for petitgrain oil in the uses of soap and detergents.

An essential oils dealer concurs on the low price, but disagrees that synthetics may absorb the market. "There is a lot of petitgrain oil around, plenty in stock here in the US and

available in South America at low prices. We don't need to reconstitute it."

Until now, therefore, trade sources agree that Paraguay's policy of restricting the size of the harvest, despite their plentitude of bitter orange trees, in order to retain petitgrain's place in the market has met with success.

SEEDS & SPICES

CUMIN SEED — Indian and Iranian cumin seed, following an August firming trend, have leaped from 83c. and 73c. per pound respectively, to \$1.05 per pound in the last week.

Turkish cumin seed gained 34c. to 98c. per pound during the same period. The price advances have been attributed to a limited Turkish crop and increasingly scarce supplies elsewhere. Chinese cumin seed has followed suit, joining the Indian and Iranian level of \$1.05 per pound.

OREGANO — Mexican oregano prices are not advancing to the extent originally expected, according to a spice broker. With the shortage of Greek and Turkish in mind, Mexican producers were thought to double their prices from \$1.05 to \$2.10 per pound next week.

Yet a lack of confirmation of the European crop's being contaminated has led Mexican suppliers to scale down their pricing outlook. "We will sell our oregano in the \$1.40 to \$1.50 per pound range," says a Mexican grower.

Beating the expected influx of Greek and Turkish material now seems to be the first concern: "We need to choose which plants, clean them, and have them in the market as soon as possible, in three weeks," he says.

POPPY SEED — Dutch Poppy advanced to 59c. per pound last week, a gain of over 80 percent since June's quote of 36c. per pound. The Netherlands growers reduced their August/September crop in a successful bid to strengthen prices. Turkish and Australian poppy prices have benefited as well, firming steadily with the Dutch to 52c. and 53c. per pound respectively.

House Unit Okays

Continued from Page 5

cent of Conrail's \$3.2 billion in revenues. Chemicals account for a similar percentage of NS's total revenues.

The proposed sale of the freight railroad is expected to be incorporated into comprehensive budget reconciliation legislation which must be passed before Congress adjourns for the November elections.

Before approving the bill, the committee eliminated several rate-regulation provisions that had been added to the legislation a day earlier by the commerce, transportation and tourism subcommittee.

After the subcommittee's vote, Transportation Secretary Elizabeth Dole urged energy and commerce chairman John Dingell, (D-Mich.) not to use the Conrail bill as a vehicle to modify the 1980 Staggers Act which deregulated the railroad industry.

Such provisions, she warned, might draw a White House veto, even though the Reagan Administration wants to put Conrail into private hands.

Mrs. Dole said the less-regulated environment created by the Staggers Act gave Conrail and other railroads necessary pricing and service flexibility to enable them to better compete with the trucking industry.

Advocates of the Staggers changes, led by Rep. Billy Tauzin (D-La.) had argued that Congress should roll back rail decontrol to protect captive shippers who depend largely on a single railroad to haul their commodities.

Captive shippers of fertilizers and dry chemicals have complained that the Interstate Commerce Commission has failed to protect them against unreasonable rate increases since deregulation. Rep. Tauzin's defeated provision would have given ICC new powers to protect shippers hurt by such market dominance.

But Reps. James Florio (D-N.J.) and Norman Lent (R-N.Y.) argued that to consider extensive new railroad regulation at this late date in the congressional session could jeopardize the Conrail bill.

"We wanted a clean Conrail bill," said Federal railroad administrator John Riley. "What we got was closer to that than any other available amendment." The FRA is a division of the transportation department.



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Sulfur Rules Give Industry 'Hobson's Choice,' Says CIBO

Environmental Protection Agency is threatening to hand American industry a Hobson's choice between unaffordable boiler emissions controls and limited fuel sources in order to obtain minuscule environmental improvements, a group of industrial boiler owners says.

The Council of Industrial Boiler Owners (CIBO), representing 50 US industrial firms that rely on a variety of fuel sources for their operations, says that proposed limitations on sulfur emissions from small, new, industrial boilers that burn coal or oil are unfair, unrealistic and untenable.

The proposals, known as New Source Performance Standards (NSPS) for industrial boilers, would require 90 percent reductions in sulfur emissions from new equipment even though the agency estimates such equipment will contribute at most only 1.5 percent of total US sulfur emissions, CIBO says. Utility emissions, which account for far more sulfur in the air, are not as tightly regulated, CIBO adds.

STRINGENT REGULATIONS

William B. Marx, president of CIBO, says, "The only way for us to meet these regulations and still be able to burn coal or oil will be to add extremely costly and unreliable desulfurization scrubbers to new boilers. Scrubbers cost as much as the boiler itself — doubling the cost of even a small unit to perhaps \$4 million — and they cannot hold up to the 98 percent reliability demand of industry."

"Most of American industry will be forced to go off coal and oil altogether as they expand or replace existing boilers," Mr. Marx asserts.

"They will be forced to burn natural gas, even though the ability to obtain it on a long-term, non-interruptible basis is a matter of debate. Furthermore, the 1978 Fuel Use Act prohibits the use of natural gas as a boiler fuel unless an exemption is obtained. Industry needs more — not less — flexibility to obtain the most economic fuel for its boilers."

Ironically, the overly stringent NSPS will encourage industry to extend the lives of existing boilers, which are dirtier and less efficient than new boilers on the market today, Mr. Marx says. "The rule actually will impede improvement in air quality," he says. "EPA clearly has not thought this rule through rationally."

Boilers create steam for industry's process uses, space heating and electricity produc-

tion. They burn not only fossil fuels but also plant-generated wastes and account for about two-thirds of the fuel burned by industry.

The proposal discriminates against industry by requiring it to meet 90 percent sulfur reduction regardless of the fuel's sulfur content, while earlier NSPS allowed utilities burning low-sulfur coal to reduce emissions by only 70 percent, CIBO says. Utility boilers are about 30 times as big as industrial units, and hence emit more.

CIBO also comments that utility boilers have economies of scale that industrial units lack, making scrubbers proportionally less costly for them, and that utilities do not need the same reliability industry needs in boilers because utilities have interconnections through which to get emergency power in the event that a boiler scrubber breaks down, as they often do.

CIBO proposes the following NSPS requirements:

- Continuation of the current emissions limit of 1.2 pounds sulfur per million Btu heat input for industrial boilers larger than 250 million Btu.

- A new emissions limit of 1.6 pounds sulfur per million Btu for small boilers (100 million to 250 million Btu).

- No percentage reduction requirement, thereby allowing industry the freedom to choose the most economic fuel sources and most appropriate emission control technologies — including emerging technologies — to meet the emissions caps.

"This NSPS fails to meet criteria under the Clean Air Act — reaffirmed in court — for EPA to base its regulation on a cost-effective, achievable, reliable and adequately demonstrated control technology," Mr. Marx concludes.

CTFA Seeks FDA Approval On Eye Colors

Cosmetic, Toiletory & Fragrance Association has asked Food & Drug Administration to approve four more colors for use in eye area products.

The colors (FD&C Red 40 and its lakes, FD&C Yellow 5, FD&C Blue 1 and D&C Green 5) are all permanently listed for non-eye area cosmetic uses.

CTFA has also petitioned for use of the yellow 5 lakes and blue 1 lakes, which are provisionally listed for non-eye area cosmetic uses.

The petitions mark the first time CTFA has requested that the agency approve new uses for permanently listed colors. Previous color additive actions by the trade group focused on defending existing uses for color additives that FDA had provisionally listed pending completion of safety tests.

If CTFA's petitions are granted, cosmetic manufacturers may expand their eye color palette for the first time since 1960.

The technical data, which seek to demonstrate that the four color additives are safe for use in eye area products, were developed by CTFA and its members in conjunction with the Certified Color Manufacturers Association and FDA.

"These petitions are the result of a tremendous cooperative effort by the two trade associations; their members and FDA," CTFA president Ed Kavanaugh commented. "By working together these groups accomplished an impressive goal."

"The use of these shades would profoundly affect the US eye cosmetic market," an industry analyst observes. "They would significantly increase the number and quality of colors available in eye area cosmetics."

"Using the new additives, we can develop eye cosmetics that are more vivid, more true, and have more depth than any on the American market," the analyst asserts.

The colors are all reported in use in European eye area products. If the petitions are granted, the shades would be available to American consumers as well.

Distributors' Chemical Sales Due to Grow

Industrial chemical distributor sales in the United States are forecast to grow 5.2 percent a year reaching \$12.6 billion in 1990, up from an estimated \$9.8 billion in 1985, as measured in constant 1985 dollars, according to a study by Charles H. Kline & Co., Fairfield, N.J.

Chemical distributor sales are expected to grow more than 50 percent faster than chemical consumption overall, driven primarily by producers consolidating their sales forces and expanding product authorizations to reduce selling costs and by the fact that producers often realize a greater net back on certain products by selling through distributors.

In addition, distributor sales are expected to grow as customers maintain lean inventories and require shorter delivery times and distributors expand services and products offered to better meet customers' needs.

Other factors likely to directly influence the future of chemical distribution in the United States include: distributor consolidation; entrepreneurial producers; imports; liability insurance cost and availability; and rationalization of domestic manufacturing capacity over 1,000 distributors.

Kline reports that over 1,000 industrial chemical distributors operate in the US with the leading five firms accounting for nearly \$2.5 billion or 25 percent of total 1985 industrial chemical distributor sales.

FUTURE MERGERS

Future mergers and acquisitions, as well as companies exiting the business, will result in fewer but larger firms.

Increasingly, chemical producers use distributors not only as a sales channel but as an integral component of their total marketing effort.

Although chemical distributors have existed for decades, they have increased in importance during the last ten years. In the past, some producers viewed distributors as a necessary evil.

Most producers now view distributors in a positive light — referring to the relationship as a partnership — and consider distributors as a dynamic extension of their sales and marketing group.

The number of distributors used by producers varies greatly. In its report Kline has identified several leading producers currently using 200 or more distributors throughout the US, while a few producers use ten or fewer distributors.

Chemical distributors serve a diverse range of end users in more than 25 industries. According to results from the new survey, paints and coatings is the leading end-use industry served by distributors, accounting for over \$1 billion or 10 percent of total sales by industrial chemical distributors.

More than one-quarter of the total raw materials consumed in the paints and coatings industry is supplied by distributors. Electronics and pharmaceuticals are two end-use industries forecast to exhibit above-

average growth in distributor sales through 1990.

Two primary factors contributing to the higher growth are the faster overall growth of these industries and the increasing focus placed on these industries by distributors, Kline says.

DOE Steady On Oil Buys

Department of Energy will not accelerate the purchase of crude oil for the Strategic Petroleum Reserve unless prices decline, Secretary John S. Herrington says.

He says that while DOE is soliciting bids from domestic producers, it is continuing to negotiate terms with Mexico, the most recent supplier to the 505-million-barrel reserve in salt domes on the Gulf Coasts of Texas and Louisiana.

Secretary Herrington says he would like to increase the reserve at the rate of 100,000 barrels per day, the practical limit of intake capacity, but "the price may be a little too high to go to that large a purchase."

The current congressionally authorized limit, which took effect September 1, is 35,000 barrels per day. Mexican shipments had been running at 50,000 barrels per day until the end of August.

Crude oil is currently priced around \$16 per barrel compared with about \$28 late last year. Secretary Herrington did not indicate how far the price would have to fall to make him increase purchases.

But he did say, "It did not make sense to me to see oil at \$9 and \$10 per barrel and not be buying 100,000 barrels a day" earlier in the year.

At the Secretary's urging, President Reagan last month reversed his position against additional purchases and told Mr. Herrington he could buy in excess of 35,000 barrels per day if the price was attractive.

President Reagan endorsed the congressional goal of a 750-million-barrel stockpile, a goal set in the late 1970's.

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closer together

An index of weekly chemical market reports is on the back cover.

	USP, gran., dms.	-	-	-	-
	Ammonium citrate, dibasic, 250-lb. dms. f.o.b. works	2.79	-	-	-
	Ammonium dimolybdate, approx. 85%, 24,000 lbs. or more	5.48	-	-	-
	Ammonium fluoride, tech., dms. c.i., l., works, frt. equal	1.79	-	-	-
	Ammonium heptamolybdate, crystal, dms., 24,000 lbs. f.o.b. works	5.57	-	-	-
	Ammonium lauryl sulfate, tanks, f.o.b. works	72	29	.32	-
	Ammonium lignin, sulfonate, bulk, f.o.b. Hoquiam, dms.	29.00	-	-	-
	Ammonium nitrate, diam. fertilizer grade, 33% N, bulk, S.E. divd.	130.00	135.00	-	-
	Ammonium oxalate, tech., fine, gran. 300-lb. dms., l., f.o.b. works	1.42	1.68	-	-
	Ammonium pentaborate gran bgs. c.i. works	75	-	-	-
	Ammonium pentaborate powder 20c per lb. higher	-	-	-	-
	Ammonium persulfate, 225-lb. dms. 24,000 lbs. or more, f.o.b. works	58	-	-	-
	55-lb. bgs., same basis	58½	-	-	-
	Ammonium phosphate (see Di- and monoammonium phos- phates)	-	-	-	-
	Ammonium silicofluoride, dms. c.i. l., works	301½	-	-	-
	Ammonium sulfate, lg. gran. works	80.00	90.00	-	-
	sld. cont., bulk, f.o.b. works	100.00	70.00	-	-
	tech., bgs., c.i., l., works	108.00	120.00	-	-
	Ammonium sulfide, lg., 40-45% tech. 100% basis, frt. equal, ship	460.00	-	-	-
	Ammonium sulfuric acid, tech. (see Ammonium thiocyanate)	-	-	-	-
	Ammonium thioacetate, tech., crystal, bgs., c.i., works	1.02	-	-	-
	tech sohd., 50%, tanks93	-	-	-
	equival., 60%, tanks, f.o.b. works73	-	-	-
	Ammonium zirconyl carbonate, sohd., bulk	1.12	-	-	-
	Amyl acetate, primary mixed isomers, tanks, divd.57	-	-	-
	Amyl alcohol, primary mixed isomers, tanks, frt. and46½	-	-	-
	Amylenic aldehyde, dms.	2.35	2.60	-	-
	p-t-Amylphenol, bulk, works91	1.03	-	-
	Amyl oil, dms.	11.50	12.25	-	-
	Anethole, tech., dms.	10.20	-	-	-
	USP, dms.	3.65	4.60	-	-
	Acrylic acid, bott.	700.00	-	-	-
	Aniline, tanks, f.o.b.33	35½	-	-
	Anise oil, kilo	11.75	-	-	-
	tanks, tank-wagon	-	-	-	170.00
	steeping drug, bulk, tank wagon on	-	-	-	175.00
	Aspirin, USP, crystal, powd., 250-lb. bds. c.i., f.o.b.	-	-	-	1.85
	10% starch granulation, white, 250-lb. bds. c.i., f.o.b.	-	-	-	1.97
	16% starch granulation, white, same basis	-	-	-	2.80
	Freight equal shpt. identical quantity one carload notes from H.Y., Phis., Midland, Miss., Orzap & Sons Louis	-	-	-	10.00
	Atropine sulfate, USP, bds	10.00	11.00	-	-
	Avocado oil, Azelac acid, tech. 50-lb bgs., l., c.i., divd	-	-	-	4.00
	Azo yellow, bgs. divd	-	-	-	1.23
	Azo yellow, 10 G. bgs., divd E of Norwex	-	-	-	4.40
	Azo Yellow pigment, bgs., same basis S/S	-	-	-	2.45
	Bactracin, USP, non sterile, one billion units per millil. million units Bartlett, NF, 50 kilsims, divd	6.30	6.80	-	-
	Bartlett-sulfurum, NF, 50 kilo dms. divd	22.50	-	-	-
	Baute, dry-grd., Southern, off-color, cont. bgs. c.i., l. no less than water-grd., white, bgs.	23.00	-	-	-
	unbleached, extra-line, pigment grade, c.i., f.o.b. works	-	-	-	160.00
	Barium carbonate, precip., bulk, c.i., bgs., name basis	25	25½	-	-
	photo grade, bgr., same basis ton works	510.00	-	-	-
	Barium chloride, 100-lb. bts., 1-10 div drs, works	1.04	-	-	-
	Barium chloride, tech., crystal, bgs., c.i. works	470.00	-	-	-
	arhyd dms. c.i., same basis ton Barium chloridate, pure, crystall. 400-lb. works	692.00	-	-	-
	c.i., same basis	3.78	-	-	-
	Barium monosulfate, 55 lb. bgs., c.i., 1-f.o.b. works	46.00	-	-	-
	octahydrate, crystal, bgs., same basis	100 lbs.	33.00	-	-
	Nitrate, 100-lb. bgs., l., works	100 lbs.	32.50	-	-

a/alpha abd./allowed anorph./anorthosis ap/aphetic A/C/American in meeting point anhyd./anhydrous AO/Association of Official Agricultural Chemists a.p./available phos- phorus approx./approximately art./artificial AS/American Society for Testing & Materials	C/Centigrade clys./carbonyls c./cubic centimeters C/Completely dena- tured c.i./cubic insurance height c./cubic foot cns./cancer com./commercial conc./concentrated o/c/chemically pure crys./crystallites AS/American Society for Testing & Materials cyls./cylinders	E/East e.p./end point equid./equalized exp./expressed extr./extracted F/Fahrenheit i.a./free alongside torment./fermentation i.f./free fatty acid i.f./free from chlorine i.p./free from prus- sian blue f./fiber f.b./free on board f.p./freezing point fr./freight	inc./included ind./industriel kgs./kings l./leavo lb./pound l.c./free carload l.f./free truckload l./liquid m./metals m.a.p./mixed airline point mcg./microgram m./meters/inchures min./minimum mol./moltan m.p./melting point	o./ortho ord./ordinary o./ounce P/phosphorus p./para Pas./Pacific p./pencil phos./phosphate photo./photographic pkg./packages pos./posited precip./precipitated prod./producer pulp./pulverized purif./purified redist./redistilled ref./refined ref./refinery resub./resublimed ret./returnable SD/specially denatured s.d./single distilled SB/Sebacic sec./secondary	secs./seconds s.g./specific gravity ship./shipment std./standard std./standard syn./synthetic tank./refined tankcar tech./technical terr./terranean ton./refers to short ton of 2,000 pounds TV/Temporary very allowable W./whenever USP/United States Pharmacopeia vis./viscosity VMA/Vanishing moment & printers W/West wise./wise W./water grade
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NOTE: A unit-ton is 1 percent of 2,000 pounds of the basic constituent or other standard of the unit ton. The price of the basic constituent by the unit-ton price shown in Chemical Reporter gives the price of 5,000 pounds of the material.

	Ammonium persulfate powder 20c. per lb. higher.				
	Ammonium persulfate, 225-lb. dms. 24,000 lbs. or more, 1.0 lb. works.				
	55-lb. bags, same basis.	.58			
	Ammonium phosphate (see Di- and monoammonium phos- phates)	.56½			
9.14	Ammonium silicofluoride, dms. c.i. 1 l. works.	301½			
	Ammonium sulfate, lg. gran., bulk, c.i. works.	80.00	90.00		
	std. con., bulk, 1.0 lb. works.	80.00	70.00		
	tech., bags, c.i. 1 l. works.	108.00	120.00		
1.37	Ammonium sulfide, lg. 40-45 tanks, 100% basis, int. equivd.	460.00			
	Ammonium sulfolucide, tech. (see Ammonium thiocyanate)				
	Ammonium thiocyanate, tech., crys- tals, c.i., works.	1.02			
	tech. soln. 50%, tanks, int. equivd.,	.93			
65.00	Ammonium thiosulfate, photographic, 60%, tanks, 1.0 lb. works.	.13			
737	Ammonium zinczinc carbonate, tech. bulk,	.72			
	Amyl acetate, primary mixed isomers, tanks, divd.	.57			
	Amyl alcohol, primary mixed isomers, tanks, int. divd.	.46½			
10.10	Amyl chloride, aldehyde, dms.	2.35	2.60		
	p-tert-Amylphenol, bulk, works.	1.01	1.23		
	Amyl oil dms.	11.50	10.20		
	Anethole, tech., dms.	4.10	3.65	4.60	
	USP, dms.	700.00			
	Aniline root oil, botts.	.33	35½		
	Aniline, tanks, 1.0 lb.	.33			
	Anise oil, tanks.	11.75			
	Bacitracin, USP, non sterile, one billion units units			6.30	6.80
	Bacitracin, USP, sterile, one billion units units			22.50	-
	Baebital, NF, 50 klotons, divd. kilo			23.00	-
	Bartlett's sulfurum, NF, 40 kilo dms.			69.00	-
	divd. kilo			23.00	-
	Barbitol, USP, Southern, off-color, coarse, bags, c.i. 1.0 needs to water prod., white, bags, c.i.			.13	-
	to 6 works.			160.00	-
	unrefined, extra-line, pigment grade, c.i., 1.0 lb. works.			25	-
	Barium carbonate, pure, bulk, c.i. works, int. equivd.			25½	-
	bags, same basis.			510.00	-
	photo grade, bags, same basis			1.04	-
	Barium chloride, 100-lb. dms., 1-10 dms. lbs. works			470.00	-
	thiurethane, tech., crys., bags, c.i.			692.00	-
	works.			3.76	-
	barhyd dms. c.i., same basis			46.00	-
	Barium chloride, pure, crys. 400-lb. dms. works.			33.00	-
	Barium monochloride, 55 lb. bags, c.i. 1.0 lb. works.			100 lbs.	-
	octahydrate, crys., bags, same basis.			100 lbs.	-
	Barium nitrate, 100-lb. bags, 1 l. works.			100 lbs.	-

Benzoin, Sumatra, cs.	lb	1.73	1.75	to	60	75
Benzoin, M.F., 1,000 lbs.	lb	1.80	-	to	70	-
same, fob.	lb	3.50	3.60	to	91	97
N.F., 1,000 lbs. or more, fob	lb	1.75	-	to	92	-
1,000 lbs. or more, fob	lbs.	4.35	-	to	60	62
12-Benzoyl disulfide (see Mercaptobenzothiazyl disulfide)	lbs.	-	-	to	55	56
Benzamide, lake, dms., 1,000 lbs.	lb	6.10	-	to	1.31	-
same, f.o.b. works	lb	-	-	to	1.17	-
pool, dms., 1,000 lbs. or more, same basis	lb	6.20	-	to	8.80	8.88
photo-grade, dms., 1,000 lbs. or more, same basis	lb	9.00	-	to	-	-
Benzothiazole, red., dms. 1 l. fob	lb	87	-	to	1.24	1.3
equid.	lb	80	-	to	1.22	-
tank, fob	lb	75	79	to	24½	3
Benzoyl chloride, dms., c. l. works	lb	57	59	to	1.20	-
tank, fob	lb	74½	75	to	1.93	-
Benzoyl peroxide, regular gran., 1,000-lb. lots or more, hys. work, fob	lb	2.35	6.98	to	1.20	-
same, fob	lb	1.71	1.95	to	1.20	-
paste, 50% and 55% formulations, dms., paste, 1 l. equid.	lb	1.20	2.60	to	1.37	1.43
Benzoylamine, dms.	lb	1.40	-	to	1.24	-
Benzyl alcohol, N.F. 1 l. dms. 1 l. equid.	lb	1.32	-	to	1.20	-
tanks, same basis	lb	1.05	2.26	to	1.40	-
photo grade, 1 l. dms., same basis	lb	1.24	-	to	1.32	-
tanks, same basis	lb	1.20	-	to	1.05	-
tank grade, 1 l. dms., same basis	lb	1.20	-	to	1.20	-
tanks, same basis	lb	1.05	-	to	1.20	-
Benzyl benzoate, dms.	lb	1.05	-	to	1.20	-
Benzyl chloride, tech., non-ret. dms. c. l. 1 l. equid.	lb	1.05	-	to	1.20	-
tanks, fob	lb	1.05	-	to	1.20	-
Butadiene, tank's works	lb	1.05	-	to	1.20	-
Butylphthalate (see Dibutyl phthalate)	lb	1.05	-	to	1.20	-
Butylstearate cosmetic, dms., 17 dms. or more	lb	1.05	-	to	1.20	-
tanks	lb	1.05	-	to	1.20	-
Butylstearate tech. 1 l.	lb	1.05	-	to	1.20	-
Butylamine (see Mono-Di and Tributylamine)	lb	1.05	-	to	1.20	-
1-Butylamine, dms., c. l. 1 l. fob	lb	1.05	-	to	1.20	-
works	lb	1.05	-	to	1.20	-
tanks, same basis	lb	1.05	-	to	1.20	-
Butylaldehyde, hydroxyaldehyde, food grade, dms., divd.	lb	1.05	-	to	1.20	-
Butylaldehyde hydroxyaldehyde, food, feed grades, c. l. 1 l. hys., divd.	lb	1.05	-	to	1.20	-
tech. hys. c. l. 1 l. divd.	lb	1.05	-	to	1.20	-
1,3-Butylene glycol, tanks, divd.	lb	1.05	-	to	1.20	-
Butyraldehyde, tanks, divd.	lb	1.05	-	to	1.20	-
Butyric acid, tanks, 1 l. ald.	lb	1.05	-	to	1.20	-
Butyric anhydride (see Ethyl butyrate)	lb	1.05	-	to	1.20	-
Butyrolactone, tanks, f.o.b. plant.	lb	1.05	-	to	1.20	-
n-Butyrolactone, dms., c. l. divd.	lb	1.05	-	to	1.20	-
tanks, divd.	lb	1.05	-	to	1.20	-
Cadmium chloride, purf. cryst. 100-lb. dms., 1 l. work.	lb	1.05	-	to	3.73	-
Cadmium CP red. dark sh. bis.	lb	1.05	-	to	11.32	12
100-lb. lots, 1 l. ald., E. of Rockies	lb	1.05	-	to	11.32	12

[illegible]

WEEK ENDING SEPT 19, 1986

Chlorinated rubber 5 10 20 cov. bags

CMC, technical, 95% minimum, low or medium vis., bgs., 24,000 lbs.			
Co. H. Hopewell, Va., 100% basis	1.25	-	
detergent makers, f.o.b. manufacturer's			
hiring, c.i., works	.84	-	
CMC, purif., high vis. (see Cellulose gum)			
Coastal pitch, indust., liq. works	250.00	255.00	
roofing, 140-155, Federal specification RP-361 Type I, bulk			
Coccolite, hard, 100% basis	350.00	-	
Cobalt acetate, dms., 11, f.t. sold	3.81	4.26	
Cobalt carbonate, powd., dms., f.t. sold	6.61	8.18	
Cobalt chloride, dms., 5,000 lbs.	4.15	-	
Cobalt chloride, 100% basis	8.20	10.55	
Cobalt hydrate, dms., 11, f.t. sold	4.25	-	
Cobalt metal, 99.5-99.9%, 250-kilo, dms., f.o.b. NY, Chicago	11.70	-	
Cobalt naphthenate, liq., 8% Cu.	2.06	-	
Cobalt nitrate, dms., 11, f.t. sold	2.74	3.45	
Cobalt oxide, imp., black, 72-73% Co.	9.51	-	
Cobalt oxide, imp., black, 72-73% Co.	9.78	-	
Cobalt phosphate powd., 32.1% Co., dms., divd.	1.35	-	
Cobalt resinate fused, 3% Co., dms., divd.	.38%	-	
Cobalt sulfate, crystal, 100% basis, or more, f.t. sold	2.81	3.54	
monohydrate, dms., f.t. sold	4.86	6.02	
Coccolite talat, 6% Co., dms., divd.	2.18	-	
Coccolite hard, 100% basis	40	45	
Coccolite hard, 100% basis	2.13	-	
Coconut oil (See Oils, Fats & Waxes market report).			
Coconut oil, acids, distilled, f.o.b.	.52	.58	
Coconut oil, acids, distilled, same basis	.54	.63	
Cod oil, f.o.b. Gloucester, Mass.			
bulk, f.o.b.	6.50	-	
Codoline alkaloid, NF, 25-kilo lots, gal.	900.00	-	
Codoline phosphate, USP, dms., 25-kilo lots	640.00	-	
Codoline sulfate, NF, 25-kilo lots	775.00	-	
Codivyl oil, NF, dms., gal.	6.30	7.25	
Copahiba balsam, dms., divd.	3.75	-	
Copahiba oleum, dms., divd.	1.50	-	
Copahiba oleum, monohydrate, crystal, tech., dms., 11, works	.71	.74	
Copper bromide, (cupric) 200-lb. dms., 100,000-lb. per-year contract, works	1.34	-	
Copper carbonate, 55% Cu, dark, dense, 50-lb. bgs., c.i., 11, works	108.30	-	
light, fluffy, 60 lb. bgs., c.i., 11, works	108.30	-	
Copper chloride (cupric), anhyd., c.i., works	.90	-	
Copper cyanide, tech. dms., 24,000-lb. c.i., or more, f.t. sold	2.30	2.82	
Copper fluoride, (cupric), liq. conc., dms., f.t., works, f.t. sold	.82	-	
Copper gluconate, FCC grade, 25-lb. c.i., 11, works	6.50	-	
Copper metal electrolytic wire bars, divd. domestic, basis	.62½	-	
Copper naphthenate, liq., 8% Cu.	1.19	-	
Copper nitrate (cupric), pure, like, dms., 11, works	.43½	-	
Copper oleate, solid, 6% Cu, dms., works f.t. sold	.97	-	
Copper oxide, black, 100% basis, 80,000-lb. lots, works	1.21	-	
red (cuprous), dms., 87½%, USN Type I, (AA), 80,000-lb. lots, works	1.19	1.20	
red, 90% Type I same basis	1.15	-	
Copper sulfate, 11, divd.	2.52	-	
ammonia, crystal, pentahydrate, 98% bgs, c.i., 11, works	46.45	-	
CP, pentahydrate, crystal, dms., c.i., works	60.00	-	
monohydrate, 35% Cu, dms., c.i., works	75.10	-	
basic, bgs., c.i., works	68.30	-	
Corlander oil, USP, dms.	22.00	28.00	
Corlander seed Moroccan	.38	-	
Rumex	.36	.37	
Corn oil (See Oils, Fats & Waxes market report).			
Corn oil, crude, fob (sceptoid), 95% acid, New York	.13½	.14	
Corn oil, acid, dms.	.50	-	
tanke	.32	.40	
Corn syrup 43 Ba., tanke, f.o.b. works	11.22	11.43	
Cortisone acetate, USP, dms., 5 kilo or more	.80	-	
Cottonseed meal (See Oils, Fats & Waxes market report)			
Cottonseed oil, acidulated (soap stock), acid, 95%, tanke, N.Y.	.13	-	
Cottonseed oil, acid, diet, dms.	.63	-	
Coumestrol, NF X, crystal, over 800-lb. lots	6.00	8.20	
Cream of tartar (see Potassium bitartrate)			
Crocoite, coater, grade 1, tanke			
100% basis	1.18	1.18	
Creosote, 220, tanke, grade 1	1.194	1.17	
p-Cresidine, fused, dms., works	.51	-	
m-Cresol, 95-98%, dms., 11, f.o.b.	1.71	-	
tanke, same basis	1.55	-	
m-Cresol, 98%, dms., 11, f.o.b.	.84	-	
tanke, same basis	.82	-	
o-Cresol, 98% pure, dms., 11, f.o.b.	.87	-	
tanke, same basis	.75	-	
98% pure, dms., 11, f.o.b.	.87	-	
tanke, same basis	.76	-	
p-Cresol, 95%, dms., 11, f.o.b.	1.22	-	
tanke, same basis	.95	1.15	
Creosyle acid, coater, dms., melampara content above 25%, melampara and p-cresylic phosphoric grades			
tanke, f.t. sold	.58	-	
Creosyle acid, dms., tanke, melampara content 25% or less, tanke, f.t. sold	.58	-	
Crotonic acid, 200-lb. lots, f.o.b. divd.	1.50	-	
Cryolite, bulk, c.i., works	\$10.00	\$60.00	

Cube root, powd., 5% rotenone, 0.6% is.	60	-
50-lb. bgs., 1 L. works	14	14
Cumene, bulk, Indian, bgs.	1.05	-
Cynulic acid, dms., c.l., 1 l. frt. equald.	1.16	1.37
Cyclanem aldehyde, 50% min. alde- hyde content, dms.	4.85	-
95.5% dms.	7.35	9.20
90-92% dms.	7.85	-
Cyclohexane, bulk, barges, wks.	3925	3925
Cyclohexanol tech., tanks, f.o.b.	52	661
Cyclohexanone tech., tanks, f.o.b.	555	581
works, dms.	56.7	-
Cyclohexylamine, tech., tanks, works	.85	-
D		
2,4-D acid, tech., 50-lb. bgs., c.l., 1 l. works, frt. equald.	1.10	1.25
2,4-D butyl ester, tech., 55-gal. dms., c.l., 1 l., works, frt. equald.	1.30	-
tanks, same basis	1.25	-
SD234 tanks, dms., c.l., 1 l.	1.89	-
2,4-D dimethylamine salt, c.l., 1 l. works, frt. equald.	8.05	-
Decyl alcohol, mixed isomers, tanks, dms.	.72	-
perfume grade, dms.	.36	-
Dehydrofluorocetic acid, 50% min. free, lead grade, 18% P. c.l., bulk, f.o.b. works	195.00	228.00
Denatured alcohol, ethyl, CD18, CD19, tanks, dms.	1.87	-
NOTE: Tank car sales require written authorization by Alcohol and Tobacco Tax Division.		
Denatured alcohol, ethyl	1.81	-
SD28, tanks, dms.	1.78 1/2	-
SD3A, tanks, dms.	1.86	-
SD23A, tanks, dms.	1.83	-
SD24, tanks, dms.	1.89	-
SD28, tanks, dms.	1.83	-
SD3A, tanks, dms.	1.78 1/2	-
SD33A, tanks, dms.	1.82 1/2	-
Denatured alcohol, ethyl, brucine formula SD40, tanks, dms.	1.83	-
Ethyl acetate, alcohol, 50% min. free, dms.	1.82 1/2	-
For ethyl alcohol on above formulae, prices are 12c. per gal. higher.		
West Coast divd. prices are the same as Eastern prices except in Idaho, Oregon and Washington where a 5c. difference on tank cars is maintained.		
Dasoxyporphine hydrochloride (See Methamphetamine hy- drochloride)		
Deltargent alkylete, straight chain do- cacybenzene, tanks, barges, f.o.b. works	45	-
Dextrin, com. emery grade, per gal. bgs., c.l., works	26.04	-
white, paper bgs., c.l., works	27.43	-
Dextrose, anhyd., com., bgs., c.l.	41.10	-
Dextrose, anhyd., 100-lb. bgs., c.l.	100.15	-
USP special, 100-lb. bgs., c.l.	46.50	-
Dextrose, hydrated com., bgs., c.l.	24.25	-
Western zone	25.60	-
Diacetone alcohol, 50% min. free, tanks, dms.	.52	-
Diethyl flavor grade, dms.	9.25	15.00
Diammonium phosphate, fert. grade, min. 18% N, 46% P, bulk, c.l., f.o.b. Fla. works	140.00	145.00
Diammonium phosphate, feed grade, 18% N, 20% P, bulk, c.l., f.o.b. Fla. works	240.00	-
ton bgs., same basis	260.00	-
Diammonium phosphate, tech., bgs., c.l., 1 l., works	62.50	-
equid.	57.75	-
food grade, bgs., c.l., 1 l., same ba- sis	57.75	-
2,4-Di-tert-amylphenol, min. 95.5% dms., c.l., 1 l., works	1.04	-
tanks, works	.97	-
Diaryl acid, OT, (yellow 14), dms., frt. equald.	6.20	-
o-Dianiline dithyodichloride, 100%, MW 244, dms.	8.25	-
2,6-Di-tert-Butyl-p-Cresol (see Butylated hydroxytoluene)	8.20	-
Diethyl fumarate, tanks, f.o.b. works	.77	.85
Diethyl maleate tanks, f.o.b. works	.83	.94
Diethyl phthalate, tanks, works	.54	.60
Diethyl sebacate tanks, works	1.72	1.89
Diethylamine, dms., c.l., dms.	1.12	-
tanks, same basis	1.06	-
2,6-Dichloroaniline, flake, dms., works	2.00	-
fused, dms., works	1.80	-
3-Chloroaniline, tech. 88% solid, dms., c.l., 1 l., f.o.b. works	1.46	1.67
o-Chloroaniline, tech., 80% dms., c.l., 1 l., works	.52	-
tanks, same basis	.45	-
98% red, dms., c.l., same ba- sis	.54	-
tanks, same basis	.47	-
p-Chlorobenzene, graded, 300-lb. tanks, f.o.b., frt. equald.	.51	.52
tanks, f.o.b., same basis	.43	.47
2,6-Dichloro-4-nitroaniline, dms., 10,000 lbs. or more, works	3.30	-
Dichlorophenoxyacetic acid (see 2,4-D)		
Dichlorophenylamine, dms., c.l., 1 l., f.o.b.	1.35	-
tanks, same basis	1.25	-
Dichloroethyl phthalate, bgs., c.l., 1 l., works	1.25	-
Dichloroethylene, tech. purity 97- 98%, tanks, works	.36	.40
Dibenzonitrile, tanks, frt. equald.	.44	.47
Dibenzonitrile lauryl sulfate, tanks, f.o.b.	.41	-
DDVP (see Dimethylolpropionate)		

[illegible]

works, fr. equiv.	lb.	100	-
mothen tanks, works	lb.	-	-
oxygenated, tanks, 11, f.o.b.	lb.	7	68
phosphate, bgs, 11, fr. and	lb.	2	52
Diphenylhydantoin-sodium USP	lb.	5	00
phosphate, 4,4'-isocyanate	lb.	-	-
polymeric, bulk, ct, min, fr.	lb.	91	-
glycol tanks, fr. and	lb.	45	-
Dipropylene glycol monomethyl ether,	lb.	-	-
ct, cl, divd.	lb.	54	-
tanks, same basis	lb.	-	-
D-oxyquarand, pure, dms, 11,	lb.	2	92
fr. and	lb.	-	-
D-oxyethylene, tech., solid, dms,	lb.	3	11
11, fr. and	lb.	64	65
Dinitroxyphthalate, tanks, divd.	lb.	61	65
Dinitroxyphthalate, tanks, divd.	lb.	61	65
Dinitroxyphthalate, 100% basis, tanks	lb.	2	75
works	lb.	3	45
100% basis	lb.	7	81
Dodecanol, sup, tanks	lb.	-	-
Dodecyl succinic anhydride, dms,	lb.	-	-
11, divd.	lb.	88	-
Dodecylbenzene (see Detergent Alkylate)	lb.	-	-
Dodecylphenol, tanks, min, fr. and	lb.	48	50
E	lb.	-	-
Dyes, color, certified colors for food,	lb.	-	-
drugs and cosmetics, 100 lb.	lb.	-	-
and over, fr. prepaid or f.o.b.	lb.	21	20
Blue, D&C, No. 1	lb.	21	20
No. 2	lb.	21	25
Green, D&C, No. 3	lb.	49	50
Red, D&C, No. 3	lb.	24	00
Yellow, D&C, No. 5	lb.	7	45
No. 6	lb.	6	45
Dyes, color, certified colors for drugs	lb.	-	-
and cosmetics 100-lb. lots	lb.	-	-
divd.	lb.	39	50
Green, D&C, No. 5	lb.	42	80
No. 6	lb.	18	85
Red, D&C, No. 4	lb.	39	90
No. 11	lb.	38	25
No. 19	lb.	4	50
No. 22	lb.	59	95
No. 28	lb.	48	95
Yellow, D&C, No. 7	lb.	21	00
No. 8	lb.	20	55
No. 10	lb.	20	55
No. 11	lb.	35	25
Dyes, color, for general use in cloth	lb.	-	-
and paper dyeing (by Color In-	lb.	-	-
dust Name) f.o.b. works	lb.	5	75
Alk A Blue black ex. conc.	lb.	5	46
Alk A Blue black 2G	lb.	4	57
Alk A Alkaline Blu Sulf 150%	lb.	19	85
Alk A Alkaline Blu Cy G	lb.	14	13
Alk B Heavy SR	lb.	6	55
Alk B Heavy SR 333%	lb.	3	72
Alk C 11	lb.	3	72
Alk C 6R0 Ex. Conc.	lb.	4	00
Alk C 10 Wood Or G	lb.	4	30
Alk C 14 Metallized Or GNA	lb.	8	15
Alk C 14 Rhodamine B Ex.	lb.	5	13
Alk C 14 Rhodamine 133%	lb.	8	85
Alk C 18 Scarlet 4R Conc.	lb.	5	45
Alk C 18 Fast Red A, Conc.	lb.	6	85
Alk C 151 Sdk Red 3B Conc.	lb.	8	85
Alk C 151 Sdk Red 3B Conc.	lb.	9	75
Alk C 48NS Conc.	lb.	12	22
Alk C 17 Fast Light Yell 2G	lb.	5	69
Alk C 22 Tartrazine Ex. Conc.	lb.	8	18
Alk C 22 Zinc Fast	lb.	18	40
Alk C 24 Brilliant Brown T Ex. Conc.	lb.	4	42
Alk C 1 Jade Crystals	lb.	9	55
Alk C 14 Malachite Green Crystals	lb.	8	90
Alk C 1 Methyl Violet Crystals	lb.	6	80
Alk C 10 Rhodamine B Ex.	lb.	10	95
Alk C 2 Bond Yell SFA 150%	lb.	10	10
Alk C 1 Sky Blue 6B Conc.	lb.	4	82
Alk C Ex. Conc. 300%	lb.	9	26
Alk C 8 Auramine G Conc.	lb.	4	50
Alk C 22 Fast Black GR	lb.	2	85
Alk C Fast Black GR 150%	lb.	4	28
DR 230 Resin Fast Brown DRN3	lb.	7	23
200%	lb.	8	16
DR 22 Resin Fast Green GL	lb.	9	16
DR 24 Ex. Conc.	lb.	7	98
DR 31 Brilliant Red 12B Conc.	lb.	8	18
DR 80 Fast Red BBL	lb.	6	16
DR 81 Fast Red BBL	lb.	6	85
DR 251 Fast Scarlet AV	lb.	8	92
DR 102 Fast Orange WSP L	lb.	2	47
W8 Conc. 150%	lb.	11	25
DR 4 Brilliant Paper Yell 3GX	lb.	4	09
128%	lb.	1	76
Brilliant Paper Yell 3GX Lb.	lb.	3	03
DR 41 Fast Yellow ROL Conc.	lb.	9	75
200%	lb.	14	40
DR 27 Resin Fast Yellow LSG	lb.	4	28
DR 81 Scarlet BA	lb.	21	00
DR 81 Pink REL 200%	lb.	3	95
DR 2 Yellow G	lb.	6	84
DR 2 Yellow G	lb.	4	91
DR 3 Orange GBA	lb.	3	77
DR 1 4Rn Paste	lb.	7	85
DR 28 Bordeaux BV 200%	lb.	17	25
DR 81 27 Blue GFL	lb.	10	05
DR 102 Fast Green GFDA 300%	lb.	22	80
10% Paste	lb.	4	10
Y 91 Jade Green Diquide Paste	lb.	3	60
Y 91 25 Olive TA Paste	lb.	5	85

Ends, tech, 85-99%, dms, 11, 11	lb.	7	00
Ephedrine, sup, anhyd, USP, 80-oz.	lb.	-	-
lots	lb.	1	25
Ephedrine hydrochloride, NF, crystal,	lb.	-	-
lots less than 1,000 lbs.	lb.	38	25
Ephedrine sulfate, USP, crystal, dms,	lb.	-	-
lots less than 1,000 lbs.	lb.	43	00
Epichlorohydrin, tanks, divd.	lb.	8	90

	Solids, lbs. (1	lb.	1,280 lb.	1,330 lb.
Evaporant (see Magnesium sulfate)				
Erythronic acid, powder, gran.	100 lb.			
dms. 1:1 or mixed 1:1, f.o.b.				
works		4.10	4.25	
Estur gum, gum-rasin type, dms. c.i.				
dvd, 11, Md. Ky. E. States,				
Harcoups, N. C. China, St.				
Louis St. Paul Va. W. Va. lb.		.75		
Estor gum, wood-roosin type, dms. c.i.				
same basis		.43	.46	
Ethyl acetate, syn., 65-68%, tanks,				
dvd, 11, f.o.b.		.41	.41	
99%, tanks, dvd		.41	.42	
Ethyl acetate, tanks, c.i., dvd, 11		1.13		
tanks, dvd		1.05		
Ethyl acetate, tanks, syn. (see Benzocaine)		.66		
Ethyl alcohol, syn., 180 pl., USP tax				
free, tanks, dvd, 11		1.55		
Ethyl alcohol, absolute, 200 pl., tax free prices 12c				
over 150 pl., tax free				
Ethyl alcohol, fermentation, tanks,				
f.o.b. works		1.06	1.28	
Price range attributable to various state tax incentives				
Ethyl alcohol, denat. (see Denatured alcohol, ethyl)				
Ethyl p-aminobenzoate, NF (see Benzocaine)				
Ethyl benzoate, dms.		1.35	1.50	
Ethyl bromide, tech., 98%, dms., c.i.				
fr. ald. E.		.75		
Ethyl butyrate, dms.		1.35	1.50	
Ethyl cellosolve, solvents, tanks, c.i.				
bgs., 1:1, fr. equiv. E.		4.55		
standard vis., 10, 20, 45, 100 cps.				
1:1, fr. equiv. E.		4.17	4.24	
medium vis., 50, 70, 100 cps.				
1:1, fr. equiv. E.		4.25		
USP vis., 7 cps bgs., 1:1, fr. equiv.				
E.		4.86		
equiv. E.				
USP (medium) 50, 70, 100 cps., 1:1		4.59	4.6	
fr. equiv. E.		4.51		
Ethyl chloride, tech., cys., fr. ald.		.29	.2	
dms., fr. ald.		.16		
Ethyl cinnamate, dms.		41.00		
Ethyl ethanalamines, mixed, dms.				
dvd, E.		1.23		
tanks, dvd E.		.45		
Ethyl ether, refined, tanks, f.o.b.		1.13		
Ethyl hexanoate, dms.		4.25	4.7	
2-Ethylhexanoic acid, dms., c.i., dvd		.83		
tanks, E.		.57		
2-Ethylhexyl acrylate, straight or				
mixed, tanks, fr. ald. E.		.75		
2-Ethylhexyl alcohol, tanks, dvd		39.5		
Ethyl iodide, cys. works		9.25		
Ethyl laurate, syn 55-gal dms.		10.60		
Ethyl isinyl acetate, syn. 55-gal				
dms.		10.85		
Ethyl methacrylate, tanks, fr.				
equiv. E.		1.08		
n-Ethyl morpholine, dms. 1:1, fr.				
ald.		2.03		
same basis		1.92		
n-Ethyl-naphthylamine, dms.		1.04		
works				
Ethyl oxalate (see Diethyl oxalate)				
Ethyl parathion (see Parathion, ethyl)				
Ethyl silicate, dist. (see Tetraethyl orthosilicate)				
Ethyl silicate, 40% available SiO ₂				
dms., c.i., f.o.b. works		1.45		
tanks, f.o.b. works		1.39		
N-Ethyl-m-toluidine, tech., liq. dms.				
c.i., f.o.b.		3.18		
tanks, same basis		3.10		
N-Ethyl-o-toluidine, dms.		2.85		
Ethyl vanillin 100 lb. dms., 500 lb. or				
25 lb. dms., 500 lb. tanks, f.o.b.		13.50		
100 lb. dms., less than 500 lbs.		13.76		
100 lb. tanks, less than 500 lbs.		14.00		
Ethylaniline (see Mono-O and Tri-)				
N-Ethylaniline, dms., c.i., 1:1, f.o.b.				
works		1.66		
tanks, same basis		1.58		
Ethylbenzene, bulk, f.o.b. Houston,				
Tex.		.22		
Ethylene, contract, dvd.		.18		
Ethylene glycol, tanks, f.o.b.		16.00		
Ethylene glycol, 99%, tanks, f.o.b.				
works		1.30		
Ethylene glycol dichloride, tanks,		7.53		
Ethylene glycol tetracetate acid, te-				
tracetic acid salt, soln. 1:1, f.o.b.		.36		
fr. equiv. E.		.36		
Ethylene dichloride dms., c.i., fr.				
equiv. E.		.36		
tanks, f.o.b. works		.32		
Ethylene dichloride, tanks, f.o.b.				
works		.17		
Ethylene glycol, indust., tanks, fr.				

	Ferric nitrate, crystal, dms., 1 l.o.b. lb.	.84	-
	Ferric oxalate, tech. gran., 50-lb. dms.	1.85	-
	Ferric oxide (see Iron Oxide)		
	Ferric pyrophosphate, FCCC/soluble powder, dms., 10,000 lbs.	1.10	1.15
	Ferric pyrophosphate, soluble, purif., pearls, 50-lb. dms.	1.11	-
	Ferric silicate, prep., 6.75% Fe, dms.	.46	-
	Ferric sulfate, partly hydrated, 100-lb bags, c.i., works.	141.00	-
	Ferric ammonium citrate, br. brown, green gran., 100 lb. dms., 2,000 lb. min., l.o.b. shipping	117.00	-
	Zc. per pound surcharge for long W. of Denver	2.00	2.95
	Ferric-manganese oxide, fine gran., 250-lb. dms., 1 l.o.b. works.	.42	-
	Ferric hydroxyethylene diamine-tris-acetic acid, industrial grade, sodium salt, soln., 4.5% Fe, i.c., 1 l.o.b. works.	.55	-
	Agricultural grade, sodium salt solution, 5% Fe, i.c., 1 l.o.b. works.	.84	-
	Ferrous fluoborate, conc., dms., 1 l.o.b. works, 1 rt. equiv.	.84	-
	Ferrous gluconate, NF, 1 l.o.b. works.	2.25	-
	Ferrous naphthionate, NF, 8% Fe, dms.	1.17	-
	Ferrous sulfate, moist, bulk, 1 l.o.b. works.	30.00	-
	heptahydrate, gran., bulk, 1 l.o.b. works.	145.00	150.00
	monohydrate, bulk, 1 l.o.b. works.	170.00	180.00
	USP, powder, 400-lb. dms.	.49	-
	Cryt., 250-lb. dms.	.61	-
	Frost, Canada dms.	10.20	-
	Steel, dms.	8.75	.75
	Fish oil, rettd., alkali, tanks, c.i.	.39	.36
	ketto-bonded, tanks, c.i.	.22	-
	light, cold-pressed, dms., c.i.	.34	-
	tanks, c.i.	.28	-
	Flashmet, com., methanoid, 80% protein grad., bulk, 1 o.b. Atlantic port.	285.00	-
	l.o.b. Gulf port.	290.00	-
	Imp. - Chinese, 85% protein min., bulk, c.i., 1 l., ex wharf, l.o.b. Atlantic and Gulf ports.	285.00	-
	Fluoboric acid, dms., 1 l., works, 1 rt. equiv.	.70	-
	Fluorocarbon, No. 11, bulk, tanks, dms.	.57	.6
	No. 12, bulk, same basis	.68	.7
	No. 22, bulk, same basis	.69	1.1
	No. 115, bulk, same basis	.88	1.1
	No. 114, bulk, same basis	1.02	1.1
	Fluostatic acid (see Hydrofluosilicic acid)		
	Formaldehyde, 3% methanol free (uninhibited) dms., gal. tank	.068	-
	44-45% (1% methanol) tanks, dms.	.1015	-
	37% (inhibited 7% methanol) dms.	.0945	-
	37% (inhibited 11-15% methanol) tanks, dms.	.1055	-
	Formamide, tanks, l.o.b.	.39	-
	dms., same basis	.44	-
	Formic acid 90% tanks, l.o.b.	.36%	-
	95% dms., c.i., works	.51%	-
	Fruuctose, crystal, 18,000 kilos or more, dms.	.90	1.1
	Fumaric acid, food grade, 100 lb. rt. equiv.	.75%	-
	tech. grade, bags, 1 l.o.b. rt. equiv.		-
	Furfural, tanks, l.o.b. Cedar Rapids, Iowa, and Gate City, Fla.	.75	-
	Furfuryl alcohol, tanks, l.o.b. Memphis, Tenn. and Omaha, Neb.	.72	-
	G		
	G salt, dms., 1 rt. acid, 100% basic.	2.30	-
	Gaifac acid, 400-lb. tanks	23.05	-
	Gaifac acid, 400-lb. tanks	85.00	105
	Gelatin, acid, 100 AOAC test, dms., 1 l.o.b. dms.	1.50	1
	125 AOAC test, dms., 1 l.o.b.	1.75	1
	150 AOAC test, dms., 1 l.o.b.	1.85	1
	175 AOAC test, dms., 1 l.o.b.	1.95	2
	200 AOAC test, dms., 1 l.o.b.	2.05	2
	225 AOAC test, dms., 1 l.o.b.	2.20	2
	250 AOAC test, dms., 1 l.o.b.	2.30	2
	275 AOAC test, dms., 1 l.o.b.	2.40	2
	300 AOAC test, dms., 1 l.o.b.	2.50	2
	Geranium violet (see Methylrosaniline chloride)		
	Geraniol, dms., 90-92% dms.	.625	-
	90-92% dms.	.56	-
	91-96% dms.	3.70	-
	Geranium oil, Moroccan	33.00	31
	Bourbon	27.00	31
	French	24.00	31
	Egypt	25.00	31
	Turkish (see Palmarose oil)		
	Geranyl acetate, dms.	.64	-
	oil, dms.	10.95	-
	Geranyl formate, syn. dms.	8.50	-
	nat. dms.	15.95	-
	Gilberrite, g.p., bulk, c.i., l.o.b.	180.00	-
	mineral, local	180.00	-
	Same basis	.85	-
	Ginger, Cochin, bags	39.00	-
	Chinese salad	44.00	-
	Ginger oil, Chinese	30.00	-
	Ginger olefin, NF, both		-
	Ginger's salt (see Sodium sulfite)		-
	Glyceric acid, tech. 90% dms., c.i.	.50	-
	l.o.b. works	.44	-
	tanks, same basis		-

WEEK ENDING SEPT 19, 1986	
Blue, bone, extracted, green, jelly-	-
gram bgs., c.i., f.o.b.	-
85 polygrams, bgs., c.i., f.o.b.	86
115 polygrams, bgs., c.i., f.o.b.	78
135 polygrams, bgs., c.i., f.o.b.	77
164 polygrams, bgs., c.i., f.o.b.	77
192 polygrams, bgs., c.i., f.o.b.	87
220 polygrams, bgs., c.i., f.o.b.	93
Gels, nicks	-
108 polygrams, bgs., c.i., f.o.b.	80
135 polygrams, bgs., c.i., f.o.b.	85
164 polygrams, bgs., c.i., f.o.b.	90
192 polygrams, bgs., c.i., f.o.b.	95
220 polygrams, bgs., c.i., f.o.b.	1.00
251 polygrams, bgs., c.i., f.o.b.	1.05
283 polygrams, bgs., c.i., f.o.b.	1.10
316 polygrams, bgs., c.i., f.o.b.	1.15
347 polygrams, bgs., c.i., f.o.b.	1.20
376 polygrams, bgs., c.i., f.o.b.	1.25
411 polygrams, bgs., c.i., f.o.b.	1.30
444 polygrams, bgs., c.i., f.o.b.	1.35
477 polygrams, bgs., c.i., f.o.b.	1.40
Glutamic acid, 99.9% dms., 100-lb.	6.65
lots, f.t. add.	-
Glycerine, nat. refid., USP, CP 99.9%	-
tanks, divd.	.89%
USP, CP, nat. 96%, tanks, divd.	.87%
Syn. 96%, tanks divd.	.91
Syn. 98.5%, tanks divd.	.89%
Glycine (see Aminoacetic acid)	-
Glycyl glutamate, 100-lb. bto dms.	14.50
f.o.b.	-
Glycolic acid (see Hydroxyacetic acid)	-
Glycolic 40% soln., bulk, tanks	-
Graphite, divd.	44%
Graphite, c.i., f.o.b.	2.75
Calif. dms.	2.25
Israeli	2.25
Graphite, amorph. powd., bgs., dms.	-
ex whse.	.16
cryst., 85-90%, powd., bgs., dms.	-
ex whse.	.30
Graphite, cryst., 90-92%, powd., bgs.	-
dms. ex whse.	.40
95-98% powd., bgs., dms.	-
whse.	.60
Graphite, amorph., cryst., 97% and up.	-
powd., bgs., dms. ex whse.	.80
Graphite, flake, No. 1, 90-95% dms.	-
ex whse.	.65
No. 2, 90-95% dms., gal.	-
whse.	.65
Gresas (See Oils, Fats & Waxes market report)	-
Gresas (See Oils)	-
Gusacod, tech., 500-lb. drums, 24,000lb.	-
min., f.o.b. Wallingford, Conn.	2.50
NOTE: Purified grades are 10c. higher	-
Gusacod, tech., 500-lb. drums, 24,000lb.	2.70
Guar gum, soluble, bgs., c.i., f.o.b.	-
shp't. gal.	.50
Indust., bgs., high viscosity, c.i.	-
same basis.	.50
Hellotropin, dms.	6.00
Hemlock (see Spruce)	-
Hemlock leaves, lb.	55
Hepiline, indust., tanks, f.o.b. Beau-	-
mont, Tex.	1.07
95%, tanks, f.o.b. Houston,	-
Tex.	1.18
Heptanol, acid, syn., tanks, f.o.b.	.85
Hexadecanol, syn., tanks, f.o.b.	43%
Hexahydrophthalic anhydride, tech.	-
dms., ILL, f.o.b. works	1.42
Hexamethyltetramine, gran.	-
c.i., ILL, works	.55
gran. dms., c.i., ILL, works	.59
pow. bgs., c.i., ILL, works	.60
powd. dms., c.i., ILL, works	.83
Hexane, indust., tanks, works, gal.	1.01
95%, tanks, f.o.b. Houston,	-
Tex.	1.12
Hexanol, syn., tanks, f.o.b.	.50
Hexyl alcohol, mixed isomers,	-
works	.32
p-Hexyl methacrylate, dms., c.i.	-
tanks	75%
Hexylene glycol, tanks, divd.	.50
Hexyresorcinol, USP, dms., 25-lb. lots	-
or more, f.t. add.	30.00
Homotripropyl methoxide, USP, 100-oz. lots, bot.	10.25
250 oz. lots, bot.	9.70
Homotripropyl methoxide, USP, 100-oz. lots, bot.	.25
Homohord herb, bto.	-
Hydrazine hydrochloride, f.t. fr.	-
Hydrazine hydrochloride, f.t. fr.	1.54
55-gal. tank, ILL, f.t. add.	1.61
Hydrolic acid, purif., 47%-67%, 2-	-
oxyb., f.o.b. works	7.50
Hydrochloric acid, tech., solid.	-
tanks, c.i., f.o.b. zone 1	.85
tanks, f.o.b. zone 1	.80
Hydrochromic acid, 40% dms., c.i., ILL	38%
f.o.b.	-
Hydrochloric acid, anhyd. (see Hydrogen chloride)	-

WEEK ENDING SEPT 19, 1986

	Gluce, bone, extracted, green, jelly-	
	grams, bgs., c.i., f.o.b.	.lb.
	85 polygrams, bgs., c.i., f.o.b.	.lb.
	115 polygrams, bgs., c.i., f.o.b.	.lb.
	135 polygrams, bgs., c.i., f.o.b.	.lb.
	164 polygrams, bgs., c.i., f.o.b.	.lb.
	192 polygrams, bgs., c.i., f.o.b.	.lb.
	220 polygrams, bgs., c.i., f.o.b.	.lb.
	Gluce, milk	
	106 polygrams, bgs., i.l., f.o.b.	.lb.
	130 polygrams, bgs., i.l., f.o.b.	.lb.
	164 polygrams, bgs., i.l., f.o.b.	.lb.
	192 polygrams, bgs., i.l., f.o.b.	.lb.
	222 polygrams, bgs., i.l., f.o.b.	.lb.
	251 polygrams, bgs., i.l., f.o.b.	.lb.
	283 polygrams, bgs., i.l., f.o.b.	.lb.
	315 polygrams, bgs., i.l., f.o.b.	.lb.
	347 polygrams, bgs., i.l., f.o.b.	.lb.
	378 polygrams, bgs., i.l., f.o.b.	.lb.
	411 polygrams, bgs., i.l., f.o.b.	.lb.
	444 polygrams, bgs., i.l., f.o.b.	.lb.
	477 polygrams, bgs., i.l., f.o.b.	.lb.
	Glutamic acid, 99 1/2% dms., 100-lb.	
	lots, frt. adid.	kilo
	Glycine, nat. resid., USP, CP 99 1/2%	
	tanks, dval.	.lb.
	USP, CP, nat. 96%, tanks, dval.	.lb.
	Syn. 96%, tanks dval.	.lb.
	Syn. 99.5%, tanks dval.	.lb.
	Glycine (see Aminoacetic acid)	
	Glycerol guaiacolate, 100-lb. tin dms.	
	f.o.b.	.lb.
	Glycolic acid (see Hydroxyacetic acid)	
	Glycidyl 40% sol'n., bulk, tanks,	
	dval.	.lb.
	Graperoll oil Fla. dms.	.lb.
	Calf, dms.	.lb.
	terash.	.lb.
	Graphite	bgs., dms.
	ex whse.	.lb.
	cryst. 88-90%, powd., bgs., dms.	ex whse.
	ex whse.	.lb.
	Graphite, cryst. 90-92%, powd., bgs.	
	ex whse.	.lb.
	95-96% powd., bgs., dms.	ex whse.
	ex whse.	.lb.
	Graphite, amorph., cryst. 97% and up	
	powd., bgs., dms.	ex whse.
	ex whse.	.lb.
	Graphite, flake, No. 1, 90-95% bgs.	
	dms., ex whse.	.lb.
	No. 2, 90-95% bgs., dms.	ex whse.
	ex whse.	.lb.
	Grease (See Oil, Fat & Waxes market report)	
	Guaiacol, tech., 500-lb. drums, 24,000 lb.	
	min., f.o.b. Wallingford,	
	Conn.	.lb.
	NOTE: Purified grades are 10c higher	
	distilled wood oil dms.	.lb.
	Guar gum, edible, bgs., c.i., f.o.b.	
	ship't p.t.	.lb.
	Indust. bgs., high viscosity, c.i.	
	same basis.	.lb.
	Hellotropin dms.	.lb.
	Hemlock oil (see Spruce)	
	Herbert leaves, bla.	.lb.
	Hextone, indust., tanks, f.o.b. Beau-	
	mort, Tex.	.gal.
	95%, tanks, f.o.b. Houston	
	Texas	.lb.
	Hexanediol, syn., tanks, f.o.b.	
	Gal.	.lb.
	Hexadecanol, syn., tanks, f.o.b.	
	Gal.	.lb.
	Hexahydrophthalic anhydride, tech.	
	dms., I.L.L. lvs. works	.lb.
	Hexamethylene tetramine, gran.	
	lbs. I.L.L. hydrocarbon	.lb.
	gnd. dms., c.i., t.l., works	.lb.
	pwr. bgs., c.i., t.l., works	.lb.
	powd. bgs., c.i., t.l., works	.lb.
	Hexane, indust., tanks, works, gal.	
	95%, tanks, f.o.b. Houston,	
	Texas	.gal.
	i-Hexanol, syn., tanks, f.o.b.	
	Gal.	.lb.
	Hexyl alcohol, mixed isomers,	
	tanks.	.lb.
	p-Hexyl methacrylate, c.i.	
	works	.lb.
	Hexylene glycol, tanks, dval.	
	or more, frt. adid.	.lb.
	Hydrocaronol, USP, dms., 25-lb. lots	
	more, frt. adid.	.lb.
	Homotropic hyaline, tech., USP	
	100-oz. lots, bott.	.oz.
	Homotropic methylbenzole, USP, 10-	
	250 oz. lots, bott.	.oz.
	Horshound herb, bla.	.lb.
	Hydroxide hydrate, 85%, frt.	
	55-gal. tanks, i.l., frt. adid.	.lb.
	Hydrolic acid, purif., 47%-57%, 2-	
	cuba, f.o.b. works	.lb.
	Hydroxyethyl alcohol, indust., sold	
	in tanks, c.i., f.o.b. zone 1	.lb.
	tanks, f.o.b. zone 1	.lb.
	Hydrochromic acid, 48% dms., o.i., i.l.	
	f.o.b.	.lb.
	Hydrochloric acid, anhyd. (see Hydrogen chloride)	

CHEMICAL MARKETING REPORTER

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L			
Lacquer diluent, petroleum, 140F-200F, b.f., l.c.	New Jersey and New York	gal.	1.25
	Houston, Texas	gal.	1.29
Lacquer diluent, petroleum 200F-240F, b.f., l.c.	Tennessee, New York and New Jersey	gal.	1.20
	Houston, Tex.	gal.	1.12
Lactide acid grade 88%, l.c., f.o.b. works			1.06
	50%, t.c., f.r. equivalent	lb.	.82
	100%, 88%, t.c., f.r. equivalent	lb.	1.03
Lactose, edible, reg. bgs., c.i., f.o.b. works			22
	Lactose, USP, reg. drms., c.i., f.r. equivalent	lb.	.55
Lactose, USP, spray dried, bgs., l.f., f.r. equivalent		lb.	.90

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100

UPE UNIVERSAL PROCESS EQUIPMENT, INC.

MAILING ADDRESS: BOX 338 ROOSEVELT NEW JERSEY 08555
 PLANT SITE: 130 SOUTH ROBINSONVILLE NEW JERSEY 08891 609-443-4545 TELEX 833021
 WE WANT TO BUY YOUR SURPLUS USED EQUIPMENT/PROCESSES/PLANTS

OVER 15,000 PIECES OF PROCESS EQUIPMENT IN STOCK...CALL TODAY!

LATEST ADDITIONS

6M ROSENBLUM 316 SS FILTER
 900 GAL. READCO SS SIGMA MIXER
 5000 GAL. PFAUDLER G/L REACTOR
 RE-GLASSED
 SHARPLES SS MDL. P-3400 (3)
 4,200 GAL. HAST C REACTOR 125 AND FV/175
 UNUSED 1900 SQ. FT. HAST C HEAT EXCHANGER

PLANTS

10,000 TYP Maleic Anhydride
 535 MM LBS/YR Paraxylene Plants
 2 Industrial sites...35 & 50 acres

(2) Niagara 36H190 SS Filters
 (5) 290 cu. ft. SS rot. vac. dryers system
 (1) 4000 gal. G/L reactor 100FV/150FV
 (1) 8000 gal. SS reactor 70/175 psi, 1/2 pipe
 coil jkt.
 48"x24" TOLHURST SS "BATCHMATIC" CENTRIFUGE COMPLETE LATE MODEL STILL INSTALLED (6)
 (2) 1200 TONS CARRIER CHILLER SYSTEM
 (2) 6'x6' RENNENBERG 304 SS ROTARY DRYERS COMPLETE & (3) 5'x25' NASH VACUUM PUMP MDL. CL 3001 AND 9001
 2 DRAIS 30 HP & (2) 75 HP SAND MILLS 316 SS
 12"x30" & 24"x38" SS S/B CENTRIFUGE
 CUMBERLAND PELLETIZERS 8" & 6" (7)
 30 CU. FT. 316 SS DBL. CONE VAC. DRYER

CORN SYRUP/STARCH PLANT

200,000 lbs/HR @ 300 psi package boiler
 150,000 lbs/HR @ 700 psi package boiler
 50,000 lbs/HR @ 250 psi package boiler
 8'x30' 304 SS rot. hot air dryer
 8'x30' CS rot. hot air dryer
 4'x31' 72 tube SS rot. et. dryer
 24,000 sq. ft. triple effect evap. T1 tubes
 600 sq. ft. U.S. Autojet filter calcite ind (3)
 600 sq. ft. Hercules 316 ELC pre/11 filter (4)
 12'x15' Elmco ball CS rot. rds. filter (2)
 7'x15' Elmco 316 SS precoat filter (2)
 8'x10' Elmco 316 SS precoat filter (2)
 500 sq. ft. 316 SS plate ht. exch.
 265 sq. ft. APV 316 SS plate ht. exch.
 Ducon SS wet scrubber 11500 cfm
 20,000 gal 316L SS mix tank 13'x20'
 9,000 gal SS mix tank 13'x8'
 7,000 gal 316 SS cone botm. tank 10'9"x9'8"
 6,500 gal 316 SS cone botm. mix tank 12'7'8"
 5500 gal 316 SS mix tank 12'x6'
 3000 gal SS mix tank 9'x6'6" (3)
 6000 gal 316 vac. tank 15 psi/FV
 PLUS MANY MORE ITEMS CALL FOR DETAILS

HEAT EXCHANGERS

50 FT.	MATERIAL	50 FT.	MATERIAL
14,615(UNUS)	TITANIUM	1,600(UNUS)	304SS/304SS
12,250(UNUS)	CS/304LSS (3)	1168	TITANIUM
6,134	CS/304SS	1,024(UNUS)	SS/PLATE (2)
8,210	CS/304SS	893	TITANIUM
7,775(UNUS)	304LSS (6)	765(UNUS)	CS/304LSS
4,846(UNUS)	CS/304SS	606	304SS/304SS
3,800(UNUS)	GR WHITE	586(UNUS)	CS/304LSS (2)
3,489(UNUS)	304LSS	481(UNUS)	CS/304SS
2,721	C/S GRAPH	482(UNUS)	CS/304LSS
2304	TITANIUM (2)	293(UNUS)	CS/304LSS
2200(PLATE)	TITANIUM (2)	293(UNUS)	CS/SS (5)
2,000	304/304SS	275	316SS/316SS
1812	TITANIUM	206(UNUS)	SS/SS

8,500 GAL. INCONEL REACTOR, 60 PSI, AGIT.
 2,000 GAL. 316SS REACTOR, 1000/100 psi
 1,300 GAL. 316SS REACTOR, 150 FV/125 PSI

4 PASSAVANT MDL. 200
 VAC-U-PRESS BELT FILTERS
 250 SQ. FT.

GLASS * GLASS * GLASS REACTORS

3,000 GAL. DEDETRICH 100/90, PHILA. DRIVE
 3,000 GAL. RA SERIES, 100/90 TW, REGLASSED
 2,000 GAL. RA SERIES, 100/90 TW, REGLASSED
 1,000 GAL. RA SERIES, 100/90 TW, REGLASSED
 1,000 GAL. E SERIES 25/90 (4)
 750 GAL. 25/90 TW, (2)
 500 GAL. RA SERIES, 100/90, TW
 400 GAL. E, SERIES, 25/90, TW
 300 GAL. E, SERIES, 25/90, TW
 200 GAL. E, SERIES, 25/90 REGLASSED, TW
 100 GAL. E, SERIES, 25/90, TW

OVER 100 GLASS LINED REACTORS IN STOCK GLASS LINED TANKS

FROM 5-22,000 GALLONS
 TRAILER LOADS OF GLASS LINED PARTS AVAILABLE
 * LOU FALCONE-OUR G/L SPECIALIST WITH 21 YRS. EXPERIENCE IS HERE TO HELP YOU *

FILTERS

12'x18' "EMCOBELT" ROTARY VAC. FILTER SYSTEMS (2)
 8'x20' EMCO, 316LSS, PRECOAT ROTARY VAC. FILTER
 8'x12' AMETEK, 316SS, ROTARY VAC. FILTER, 300 SQ.FT.
 6'x20' AMETEK, 316SS, ROTARY VAC. FILTER, 137 SQ.FT.
 8'x21' EMCO POLYPRO EXTRACTOR SETTLERS (3)
 4'x20' ST. LINE HORIZ. VAC. BELT FILTER SYSTEM
 12'x13' EMCO H. BELT EXTRACTOR
 48" SHRIVER ALP POLYPRO COB FILTER PRESS, 57 CHAMBERS
 48" POLYPRO REC. P/F AUTO FILTER PRESS
 42" DURCO QUADRAPRESS MDL. QP-42/20-55, POLYPRO

DUST COLLECTORS

SS & CS, PULSE JET AND SHAKER TYPE
 400-112,000 SQ.FT.

WE HAVE OVER 700 SS TANKS IN STOCK

COMPLETE PLANT SITE FOR SALE

Former Synthetic Gas Plant. 60 acres of land, 75,000 sq. ft. of building built in mid 70's. Complete with all improvements including rail and pipe line transmission. We will sell entire facility or individual pieces of equipment. Major items are:

- (2) 7.2 million cu. ft. per day hydrogen plant
 - (4) 150,000 LB/HR 620 psi Boilers complete with Demineralizer systems
 - (2) 2500 KVA Generators
 - Emergency Turbine Generator Solar Centaur 3700 HP complete
 - 100's of Heat exchangers-CS and SS up to 15,000 sq. ft.
 - 100's of Pumps and Compressors
 - 100's of Tanks - both atmospheric and pressure
- CALL FOR DETAILS!

19,000 GAL. 316 SS FERMENTATION SYSTEM

CALL NOW ABOUT GIANT RHODE ISLAND & NEW JERSEY LIQUIDATION ALL EQUIPMENT STILL INSTALLED

(89) Glass lined & SS Reactor systems complete with condensers, receivers and control panels. from 50 gal. to 4000 gal.

(40) Filter Presses polypro & SS from 18" to 56" plate and frame recessed plates.

(25) Vacuum dryer systems complete with condensers, vacuum pumps and receivers.
 Double Cone: glass & SS.
 Rotary 316 SS vacuum dryers
 Vacuum Shelf SS and Herecite lined.

(18) Centrifuges 316 SS automatic basket centrifuges complete with controls and nitrogen purge
 Scrubber systems/Vacuum filter systems/Glass lined and SS tank farms.
 MUCH MORE!!!

WE WANT TO BUY YOUR SURPLUS EQUIPMENT, PROCESS UNITS AND COMPLETE PLANTS. WE HAVE OUR OWN DISMANTLING CREWS

AARON EQUIPMENT COMPANY

DIVISION ARLCO INCORPORATED
 735 EAST GREEN STREET
 P.O. BOX 80
 BENSenville, IL 60016
 (312) 350-2200
 EX 28 9454 CABLE AARONCO

QUALITY EQUIPMENT AT COMPETITIVE PRICES

Special Sale

MUST MOVE STAINLESS TANKS
 12,000 GAL., T304SS, 12" Dia. x 14' high, flat bottom, open top (16)
 PRICE \$8000 ea. FOB PA #20655

TANKS-S/S

2000-Tank, S/S vert., 1200 gal., 6' dia x 6', flat top & bot.
 2001-Tank, SS, 9000 gal., agit., 12' dia x 14'6" H.
 2005-Tank, SS, 12000 gal., 12' dia x 14', flat bottom, open top.
 1003-Jas. Cal. horz. tank, 304SS, 16,000 gal., 12'6" dia. x 22'6" long, 10 PSI.

UNUSED CENTRIFUGES

21593-Sharples P5400 Sanitary Centrifuges w/200 HP motor, 25 HP back-drive, gearbox, 5" pitch conveyor, CLP, control panel (2) LATE MODEL

CENTRIFUGES

2002-2nd, 16' x24" steel, conical bowl.
 2003-2nd, 24' x28" steel, con. bowl, gearbox.
 2009-2nd, 18' x28" S/S, 15 degree, conical bowl
 2004-2nd, 24' x30" H. screws, steel w/motor
 2004-2nd, 22' x30" SS T316 conical, 75HP
 12000-2nd, 18' x26" conical, 10 deg., T317 ELC
 2017-4th, 18' x24" 418-B31-60, 316SS, gearbox
 12000-2nd, 304SS, Marco mdl. 16L, 301P
 12000-2nd, 304SS, 3 phase, P3000, S/S, cat drive.
 2007-Sharples P2000 316SS, 20 HP drive motor
 21593-Sharples P5400 w/gearbox
 2008-Sharples P5400, 52' 1 gearbox, S/S cat drive
 21593-Sharples P5400, S/S, gearbox & motor
 1949-Sharples P5400, 316/317SS, 2001 HP, gearbox

CENT-BASKET VERT.

2140-Detrol 22'x16" vert. basket hyd. drive
 2140-Detrol 22'x16" vert. basket, 40'x24' 316SS, 30 HP, hyd. drive
 2140-Sharples Sledge-Pak, SP-5500, 40'x24" basket centrifuge



FILTER PRESSES

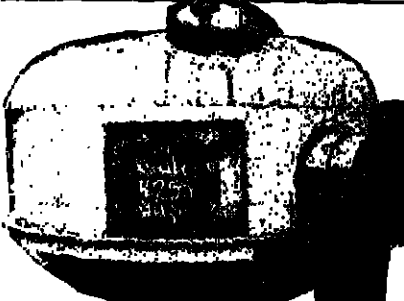
1994-2nd, P&F filter press, 12'x12' alum. plates, closed delivery, 23 chambers.
 1994-Sperry Filter Press, 30", alum.
 1994-2nd, 32' x32', polypropylene, 27 plates, ratonol drive
 1994-2nd, ALP, plate & frame, 18'38" x 36", S/S, re-coated plates
 2007-Sperry filter press, 30", cast iron plates, closed delivery
 1994-2nd, independent filter press, 42" x 42", polypropylene, 1 eye closed, 34 chambers
 2000-Sperry filter press, 42" Encl closer, 41 alum. plates



1992-Von Roll Filter Press, polypropylene plates & frame, 22 chambers, 722 sq. ft. filter area.

DIESEL GENERATORS

22111-Detroit Diesel Generator 400 KW 16 cyl. mod. 71647000, fan cooled w/switchgear S/N 88375
 22112-Detroit Diesel Generator 500 KW 16 cyl. mod. 71647005, Turbo-charged w/switchgear S/N 88724
 Call Jerry Cohen 312-350-2200



21772-Drucknische (Rosenmund Type) Pressure Batch Filter, 17' Dia., 75 Sq. Ft., jacketed, agit., 15 HP, Side Discharge... Call Jerry Cohen 312-350-2200

REACTORS

20252-Unused Reactor, 600 gal., 304SS dimple jkt.
 10108-Plauder 600 gal., T-316 SS, 55 PSI int/150 PSI
 20928-Brighon, 4000 gal., 8' dia x 10', 316 ELC S/S
 20456-Reactor, 4,000 gal., 316 S/S, 8' dia x 7'9" at side.
 15475-Brighon, 4000 gal., 316SS, vacuum.
 20287-GH Hicks, 4000 gal., 316 SS, pipe coil jkt.
 20723-Richmond Eng. Reactor, 4600 gal., T316 stan/cad.
 Plauder 10,000 gal. reactors T316L, 100 psi int., 180 psi Plauder 15,000 gal. reactor T316L, 100 psi int., 200 psi jkt.

DUST COLLECTORS

21125-Fulton-Lin. p/f 509-48 bin vent, 42 sq ft.
 16398-Marko dust collector, S/S, 63 sq ft., mdl. 9-6-100, pulse jet
 21153-EVO, bin vent, 72 sq ft., S/S, 5 HP
 20253-Unused EVO pulse jet collector, mdl. 84BF008C, 90 sq ft.
 21132-J1 Daymnd RJ-18R36, 125 sq ft., CS, 3 HP.
 21222-Fun-Jet, mdl. 501E-80, 151 sq ft.
 20396-Pulse jet collector, "FlexiClean", mdl. 56CT24 AV II w/175 sq ft. cloth, C/S
 21286-Marko dust collector, 285 sq ft., S/S
 20256-Unused EVO Corp. pulse jet dust collector, mdl. 90BF030C, 350 sq ft.
 20255-Unused EVO Corp. dust collector, shaker type, mdl. MS049C10, 575 sq ft.

SCREENS

21203-Spout Waltron sifter, D10, 6 decks.
 21150-Spout Waltron, D10, 1 HP, 10 decks, S/S cont.
 21167-Spout Waltron, D10, 2 HP, 10 decks, S/S cont.

MIXER/EXTRUDER

17054-AMK 25 gal. Extruder, Sigma, ST 7.5 HP.
 18288-J.H. Day 25 gal. Dispersion, 25 HP van main, 10 HP vert screw.
 20996-AMK 30 gal. S/S, jkt. Sigma, 7.5 HP Main, 6 HP screw.
 21234-AMK 40 gal. S/S hot oil jkt., Sigma 6" dish. screw.
 19829-AMK 50 gal. ST, jkt., Sigma, 10" dish. screw.
 10421-AMK 75 gal. ST, jkt., Sigma, 10" dish. screw.
 17136-AMK 120 gal. ST, Sigma, 11.5" screw.
 14832-AMK 160 gal., S/S, Sigma 15HP main, 10HP screw
 19484-AMK 180 gal., S/S, Sigma, 50 HP main, 10HP screw
 20118-AMK 180 gal., ST, Sigma, 16 HP/10 HP
 003227-New Aaron 300 gal., T304SS, mix extruder, Sigma, jkt., up to 200 HP main, 75 HP hyd. screw.
 STILL INSTALLED...CALL NOW!

21350-B.P. 500 gal. Sigma steel, jkt. 125 psi, 150 HP, Hyd. tilt

MIXERS - PLOW

603756-Lincolnd, FKM 6000, SS jacketed, 25 HP.
 20764-Lincolnd, FKM 30000 66 CF, S/S, jkt. jacket.
 18214-New Plow Mixer, 80 cu. ft., 34755, jacket, 100HP.
 20826-Lincolnd FKM 42000, S/S, 87 cu. ft. jkt.

MIXER RIBBON

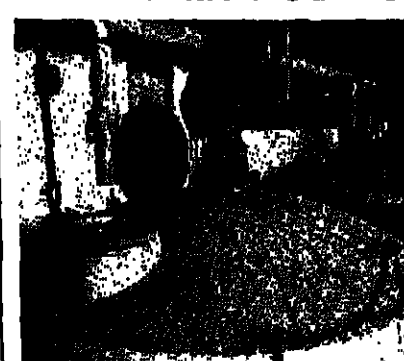
21120-Ribbon Blender, S/S, 10 cu. ft., jkt. SS, 160 gal.
 20276-Read ribbon blender, 14.7 cu. ft., 304SS, 3 HP.
 20618-Unused Day, 316SS, 23 cu. ft., 5 HP.
 20189-Robinson, 25 cu. ft., S/S, jacket, 10 HP.
 20988-Int'l 34 cu. ft., S/S, d. ribbon, 5 HP (4)
 20212-Hass ribbon, 36 cu. ft., S/S, 16 HP.
 19286-Ribbon Mixer 80 cu. ft., T304 SS, 16 HP (4)
 15506-Howe, 118 cu. ft., sanitary S/S, double spiral ribbon.
 20983-Shing Scott Blender, 130 cu. ft., 304SS, 25 HP gear motor.
 21124-Ribbon Blender, 304SS jkt., 180 cu. ft., 30 HP.
 20914-Unused J.H. Day ribbon, 8/9 270 cu. ft., 26 HP.
 21114-J.H. Day ribbon blender, S/S, 400 cu. ft., 75 HP, 480 cu. ft.

DRYER-ROTARY VAC.

19844-Schulz Rot. Forcune Processer/Polyester Dye Crystals 60" dia x 18' long, 1304 SS, 40 HP

LIQUIDATION SALE

BUY FROM CALUMET CITY ILLINOIS LOCATION AND SAVE!
LARGE POLYSTYRENE PLANT



21898-Brighon Corp. 12,000 gal. vessel.

21875-Bins, 176 cu. ft., S/S, cone bottom flat top. (4)
 21891-Bins, 450 cu. ft., C/S, epoxy lined. (8)
 21894-Bins, 450 cu. ft., C/S, epoxy lined. (6)
 21895-Bins, 500 cu. ft., C/S, epoxy lined, flat top, conical bottom. (4)
 21816-Worthington cent. pump, C/S, 15 HP, 200 GPM at 44 psig (2)
 21816-Union Pump-Inline, C/S, mod. 4x8x8.5 VCK, 40 HP. (3)



21888-Strong Scott Rib Blender.

21817-Ingersoll Rand Pump, in-line pump, C/S, 30 HP.
 21816-Goulds, C/S turbine pump, 200 HP. (2)
 21813-Worthington cent. pump, S/S, 2 HP. (4)
 21812-Union pump-in-line, S/S, 1.5 HP (2)
 21898-Plauder Reactor, 1,600 gal., T316 SS dimple jkt.
 21898-Plauder Reactor, 10,000 gal. 316L SS clad, 80 HP. (4)
 21898-Plauder Reactor, 15,000 gal. 316L SS dimple jkt. (3)



21893-Bird Centrifuge, 32x50, 80:1 gearbox.

21893-Enviroengineering scrubber, mod. A33-14000
 21895-Tank, 850 gal. vert. coat tar epoxy lined.
 21811-Tank, 5400 gal. vert. C/S epoxy coated flat top/ bot.
 21803-Tank, 50,000 gal. vert. C/S epoxy, flat bot. conical top.
 21898-Brighon Corp. Tank, 12,000 gal. vert., solid 316L SS. (5)



21870-Welox 5" Extruder, 600 HP.

21897-Metal Arts Corp. Vessel, 17,000 gal. vert. 317L SS. (2)
 21810-Tank, 640 gal. flat top & bottom.
 21820-Modern Working Tank, 4800 gal. horz. rubber lined.

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CHEMICAL PROFILE

METHANOL

SEPTEMBER 22, 1986

SUPPLY

PRODUCER

Alr Products, Pensacola, Fla.	60
Borden, Gelsmar, La.	200
Celanese, Bishop, Tex.	150
Du Pont, Beaumont, Tex.	250
Georgia Gulf, Plaquemine, La.	126
Lyondell Petrochemical, Channelview, Tex.	200
Tennessee Eastman, Kingsport, Tenn.	55
Texaco, Delaware City, Del.	100
Sterling Chemicals, Texas City, Tex.	100
Total	1,286

CAPACITY*

*Millions of gallons annually of methanol. Alleman Chemical Company mothballed its 130-million-pound-per-year Plaquemine La. facility in July, 1984. The unit is now for sale. Celanese indefinitely idled its 230-million-gallon-per-year Clear Lake, Texas facility in early 1984. Du Pont's Beaumont plant tolls natural gas from its Conoco subsidiary and Phillips Petroleum Company. Du Pont takes about half the output for internal needs. Phillips takes about 10 percent for its MTBE operation while Gantre and Tenneco take equal portions of the remainder for merchant sales. Du Pont restarted the Beaumont plant in March of 1985 after shutting the unit in early 1985. Du Pont will also shut its Deer Park, Tex. 200-million-gallon-per-year plant this October. The company will turn the unit over to USI Division of National Distillers & Chemicals Corporation as part of an agreement to end the Du Pont/USI Syngas joint venture. USI is undecided on whether to restart the unit. Georgia Gulf was formed January, 1985 in a management buyout of Georgia-Pacific chemical interests. Rohm and Haas has a 22-million-gallon-per-year plant on standby at Deer Park, Tex. Sterling Chemicals acquired its methanol unit in an August leveraged buyout of Monsanto's Texas City, Tex. site. Sterling said it will close the unit in the first quarter of 1987. Texaco acquired its facility in December, 1984 when it bought Getty Oil Company. Tenneco has an idled 140-million-gallon-per-year unit at Pasadena, Tex. Profile last published 9/19/83; this revision, 9/23/86.

DEMAND

1985: 1.29 billion gallons; 1986: 1.35 billion gallons; 1990: 1.6 billion gallons.

GROWTH

Historical (1976-1985): 4.1 percent per year; future: 4.5 percent per year through 1990.

PRICE

Historical (1953-1986): High 71c. per gallon, tanks, f.o.b. Gulf Coast; low, 11c. per gallon, same basis. Current: 27c. per gallon, Gulf Coast barges.

USES

Formaldehyde, 27 percent; MTBE, 25 percent; acetic acid, 11 percent; chloromethanes, 7 percent; solvents, 8 percent; methyl halides, 4 percent; methyl methacrylates, 4 percent; methylamines, 3 percent; methylene chloride, 2 percent; utility power, 1 percent; miscellaneous and exports, 2 percent.

STRENGTH

MTBE demand will expand by up to 15 percent annually through 1990. Shutdown of over 600 million gallons of annual capacity in the US in the last 3 years has moderated methanol oversupply. Falling US natural gas prices have

Continued on Page 69

BASF Plastics Unit

Continued from Page 7

opment in the plastics sector. (In addition, BASF bought Inmont Corporation in August 1985, and purchased the fibers operations of American Enka in December, 1985.)

The company's most recent investment decision came last week. BASF said it will build an advanced composites production facility at its main complex in Ludwigshafen.

The facility will produce a range of prepegs and structural adhesives made from epoxy resins impregnated with carbon fibers. The facility will be fully on stream in early 1988 at a cost of \$19.5 million.

BASF says the laminates plant will provide a European base for BASF Structural Materials, Inc., a Charlotte, N.C.-based unit of BASF, which was formed in Spring 1985 following BASF's purchase of Celanese Company's laminates business.

These assets include the "Celon" carbon fibers division which produces carbon fibers, and Narmco Materials, a maker of film adhesives and prepegs.

To meet US growth for these advance composites in aerospace uses, BASF Structural Materials has launched a \$20 million carbon fiber precursor plant at Williamsburg, Va. to support a recently expanded 150-metric-ton-per-year carbon fiber plant at Rock Hill, S.C. The Ludwigshafen plant is expected to meet European demand for laminates in both aerospace and automotive applications in the late 1980's.

The addition of sheet molding compound capacity gives BASF greater flexibility in marketing its line of advanced plastics. However, the company's strength continues to lie in its large and growing stable of engineering thermoplastics.

TWO RECENT ADDITIONS

Its most recent additions are two lines of polymer blends, one alloying polyphenylene ether (PPE) and high-impact polystyrene (HIPS) under the trade name "Luranyl", and the other blending PPE with nylon, called "Ultranyl".

These two products are in the first stages of commercialization, BASF says, and are made in small quantities in a pilot plant. BASF is currently building a 12,000-metric-ton-per-year plant for "Luranyl" and "Ultranyl" products, which is due on stream in the second quarter of 1987. The company plans to later extend this capacity to 24,000 metric tons.

BASF is basic in PPE, HIPS, and nylon. The company plans to market the new alloys to the automotive industry in making hub caps, spoilers, air vent grids, wing mirror housings, instrument panels, steering column casings and other components. It will also sell the plastics to the electronics industry for use as machine housings, printed circuit boards, and other applications.

The company is paying sharp attention to the automotive industry, which has embraced plastics in a wide variety of non-structural, and increasingly, in structural applications. In addition to its PPE-based alloys, BASF markets a number of engi-

neered plastics to the auto industry, including:

- "Novolen" group of polypropylene-based products for making fenders on low-medium priced cars.
- "Ultradur" and "Ultradur" families of polybutylene terephthalate (PBT) blends for use in spoilers and fenders of higher-priced cars. "Ultradur" consists of elastomer-modified PBT, while "Ultradur" alloys PBT with polycarbonate.
- "Ultradur" KR 4446, a mineral-reinforced nylon 6 tailor-made for the front spill and hubcap of the Opel Ascona. This thermoplastic can be painted on line.
- "Ultradur" KR 4470, a fiber glass reinforced nylon 6 composite steering wheel of the 1987 "Quattro Sport."
- New grades of "Elastolan", glass reinforced thermoplastic polyurethanes used in painted components needing chip resistance, such as door trim, and door sill coverings.
- "Ultraform" N 2200 G4, a glass reinforced acetal resin used to make torsion bars in certain models of Mercedes-Benz autos.

Looking ahead, BASF is committing its resources to a European research project, "Carmat 2000", that seeks to design and build an auto made mostly from plastics. BASF says it will contribute a plastic roof, laminate engine mounting, and sheet molding compound based engine hood to the project.

While BASF is devoting large amounts of time and resources to developing engineering resins, it is not neglecting standard plastics. The company has come up with several new grades of its "Novolen" polypropylene products, for automotive and packaging applications.

New catalyst systems designed by BASF have also breathed new life into the company's polyethylene products.

House Okays

Continued from Page 7

accepted a proposal by Rep. Berkley Bedell (D-Iowa) to eliminate a \$50,000 exemption for 127 pesticide ingredients for which EPA already has issued re-registration standards. Making those ingredients subject to the full \$150,000 fee would raise another \$6 million for EPA's work.

But lawmakers then defeated an attempt to fill the remaining \$48 million shortfall by doubling the fees on chemical companies.

"We have gone too far and been through too much controversy to lose this bill to a veto because it is not properly funded," argued Rep. Steve Gunderson (R-Wis.) in offering the amendment. "You are going to have to choose between properly funding this legislation or cutting some other program later on."

Rep. Bedell countered that "pesticides benefit all of society" and therefore the chemical industry should not have to bear an inequitable share of the funding.

Rep. Pat Roberts (R-Mont.) also opposed the amendment, noting that any increase in fees would be passed along to farmers, the primary consumers of pesticides.

JOBS & PEOPLE

Chemcentral Appoints Sales Representatives

ChemCentral Corporation has appointed William T. Hugo resident salesman in New York and W.M. Chamberlain sales representatives of Southern Oklahoma and the Texas Panhandle.

Prior to joining ChemCentral, William Hugo was assistant director of marketing for a drug firm in New Jersey; he will be handling the New York and New England areas.

W.M. Chamberlain, who was hired in Dallas and completed his training in Oklahoma City, is a chemical engineering graduate from the University of Arkansas.



Edward R. Lachey, who has been appointed manager of corporate purchasing at Stepan Company. He has for several years been active in chemicals purchasing and crude oil trading with Amoco Corporation.



W. Hugo



W.M. Chamberlain

DENNIS CHAPMAN has been elected to northeast regional manager for the Bio-Guard pool and spa division of Bio-Lab Inc. of Oyster Bay, N.Y. CATHY TORELLI assumes account responsibilities in the New York metropolitan area after having been with the fragrance sales division of International Flavors & Fragrances, Inc. for five years.

PAUL SZYMBORSKI has been named product manager for Norton Chemical Process Products.

PAUL HERRLETT has been appointed manager of technical sales for Amerchol Corporation, covering selected customers in the



P. Szymborski



P. Herlett



P. Szymborski



P. Herlett

international division, responsible for sales and service in the United Kingdom.

JACK MCCLARRAN has been named vice-president of the urethane division of Flexible Products Company. JOAN COCHRANE has been appointed manager of administrative services for the organics division of the Witco Corporation.

Felton Elects Two Perfumers to L.A. Lab

Felton, Inc. has appointed Richard J. Ray lab manager for its western division and Steven Claisse director of fragrance development at the company's Los Angeles offices.

Richard J. Ray left his position as food technologist with Baskin Robins, national lab in Burbank, Calif. to head Felton's Los Angeles laboratory.

Steven Claisse, formerly a perfumer with Robertet, Inc. of New Jersey, now heads the fragrance division of Felton's Los Angeles offices.



Dr. John A. Kelly who has been named international director of research for W.R. Grace & Co.'s Dearborn division. He will head the recently expanded water treatment facilities at the division's headquarters in Lake Zurich, Ill.



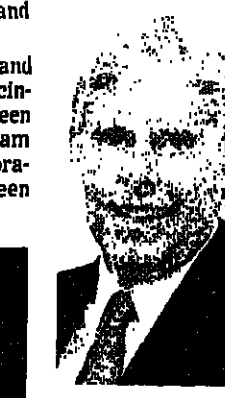
R.J. Ray



S. Claisse

named sales representative for the hydrogen peroxide department of Degussa Corporation. WILLIAM TERRY has been elected senior vice-president and general manager of Damon Biotech.

RICHARD BROWNELL has been named

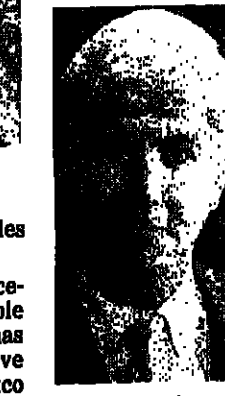


V. McClarran



J. Cochran

vice-president of the new spices and seasonings division of Bush Boake Allen, Ltd. CLARENCE WILLIAMS has been elected assistant vice-president of information systems for Bels Laboratories. MARYLOU VOAKUM has been named sales representative for the Dallas area of Unocal Chemicals.



P. Sheridan



D. Metcalfe

MEETINGS CALENDAR

SEPT 22, 1986

THIS WEEK

CHEMICAL INDUSTRY ASSOCIATION, monthly luncheon meeting, Parker Meridian Hotel, New York, September 25.
CHLORINE INSTITUTE, Fall meeting, The Homestead, Hot Springs, Va., September 21-25.
CONFERENCE BOARD, business outlook conference, Waldorf-Astoria Hotel, New York, September 24-25.
COUNCIL FOR CHEMICAL RESEARCH, annual meeting, Northwestern University, Evanston, Ill., September 28-30.
PULP CHEMICALS ASSOCIATION, 13th International pulp news meeting, Waldorf-Astoria Hotel, New York, September 15-17.
SYNTHETIC ORGANIC CHEMICAL MANUFACTURERS ASSOCIATION, OSHA compliance trade fair and seminar, Intercontinental Hotel, New Orleans, La., September 25-26.
WOMEN IN FLAVOR & FRAGRANCE COMMERCE, annual open dinner meeting, Loew's Grandpoin, New York, N.J., September 25.

OCTOBER

AMERICAN MICROCHEMICAL SOCIETY, eastern analytical symposium, jointly with American Chemical Society and Society for Applied Spectroscopy, New York Marriott Hotel, New York, October 20-24.
ASSOCIATION OF THE NON-WOVEN FABRICS INDUSTRY, eighth international conference and exhibition, Georgia World Congress Center, Atlanta, Ga., October 21-23.
CHEMICAL GROUP, NATIONAL ASSOCIATION OF PURCHASING MANAGEMENT, Fall Conference, Marriott Pavilion Hotel, St. Louis, Mo., October 21-23.
CHEMICAL SPECIALTIES MANUFACTURERS ASSOCIATION, seminar on aerosol technology, Ramada Hotel O'Hare, Rosemont, Ill., October 27-29.
COMMERCIAL DEVELOPMENT ASSOCIATION, impact of mergers and acquisitions on the future of technology-driven corporations, Hershey Hotel, Hershey, Pa., October 26-28.
DRUG, CHEMICAL & ALLIED TRADES ASSOCIATION, 88th annual meeting, The Breakers, Palm Beach, Fla., October 15-19.

EUROPEAN CHEMICAL MARKETING RESEARCH ASSOCIATION, 1986 conference, "The Chemical Industry Faces its Future," Switser Eurotel, Antwerp, Belgium, October 13-15.

EUROPEAN PETROCHEMICAL ASSOCIATION, annual meeting, Monte Carlo, Monaco, September 28-October 1; distribution meeting, October 18-October 22.

FIRE RETARDANT CHEMICALS ASSOCIATION, Fall conference on proper processing and selection of flame retardants, Kiawah Island, S.C., October 18-22.

SOCIETY OF CHEMICAL INDUSTRY, chemical industry medal dinner, Plaza Hotel, New York, October 15.

SOCIETY OF THE PLASTICS INDUSTRY, plastics show and conference — South, jointly with the Society of Plastics Engineers, Georgia World Congress Center, Atlanta, Ga., October 8-10.

SOCIETY OF THE PLASTICS INDUSTRY, polyurethane division, 30th annual rigid polyurethane technical/marketing conference, Toronto, Ontario, Canada, October 5-17.

LATER ON

AMERICAN PETROLEUM INSTITUTE, annual meeting, San Francisco, Calif., November 9-11.

CHEMICAL SPECIALTIES MANUFACTURERS ASSOCIATION, 73rd annual meeting, Marriott's Harbor View Resort, Fort Lauderdale, Fla., December 7-11.

FERTILIZER ROUND TABLE, Sheraton Inner Harbor Hotel, Baltimore, Md., November 17-19.

FRAGRANCE MATERIALS ASSOCIATION of the UNITED STATES, 10th international congress of perfumers, annual sales and flavors, Omni Sheraton Hotel, headquarters hotel, Washington, D.C., November 16-20.

K-86, 10th international trade fair for plastics and rubber, Dusseldorf, West Germany, November 8-13.

LATIN AMERICAN PETROCHEMICAL ASSOCIATION, sixth annual meeting, Rio Palace Hotel, Rio de Janeiro, Brazil, November 28-29.

NATIONAL ASSOCIATION OF CHEMICAL DISTRIBUTORS, 15th annual meeting, Ritz-Carlton Naples Hotel, Naples, Fla., December 2-8.

NATIONAL PAINT & COATINGS ASSOCIATION, 30th annual meeting, Atlanta Hilton Hotel, Atlanta, Ga., November 3-5.

BUSINESS BRIEFS

A.L. LABORATORIES Inc., maker of "BMD" antibiotic for swine and poultry, has established new corporate headquarters in Northern New Jersey. The company's new address is One Executive Drive, P.O. Box 1399, Fort Lee, N.J., 07024. The new facility houses all executive, marketing and sales management personnel. A.L. Labs will continue to operate its manufacturing plant in Chicago Heights, Ill.

ALMA plans to introduce a new liquid makeup available in six shades as part of its protective skin care line. According to ALMA, the liquid makeup category is one of the fastest growth categories in cosmetics. Fifty-eight percent of women in the US use liquid makeup and 46 percent of this group use it every day. The new product contains ALMA's "Cell Energizing Complex" and also

AVERT LABORATORIES has introduced a new dosage of its "Posture" high-potency calcium supplement made of calcium phosphate. The company has also launched a new vitamin D formula. Avert, a division of American Home Products, claims a leadership role in the treatment of osteoporosis. EASTMAN CHEMICAL PRODUCTS INC. has introduced a reactive polymer intermediate in plastics, coatings and other evaluation in plastics. Eastman says the acetoacetoxy group in the acetoacetoxy portion of the molecule and the acrylic double bond provide two separate reactive sites for exploration for polymer development with AAEM.

JOHNSON WAX's specialty chemical group has started production at a new plant in Seaford, Del. The state-of-the-art plant will

serve as the production resource for the company's line of "Joneryl" polymers and will serve customers in the Eastern and Southeastern US. Plant equipment is designed to manufacture polymer intermediates for use in the graphic arts and coatings industries. MONSANTO COMPANY has broken ground for a new plastics applications development center in Springfield, Mass. Monsanto says the new lab, which is scheduled to open in mid-1987, will allow the company to work more closely with its customers to help determine what resin is best for an application, how the part will function, and how customers can obtain the best balance of cost and performance.

OLIN HUNT SPECIALTY PRODUCTS Inc., a subsidiary of Olin Corporation, has introduced "Waycoat" HPRD 429 Developer for the semiconductor industry. Formulated for

track processing, the product is a metal ion free developer for positive photoresist. It is supplied ready to use, and is compatible with existing processes that employ "Waycoat" HPRD 409 Developer, Olin says. PPG INDUSTRIES has introduced a new custom-designed synthetic silica which offers significant cost savings when used as a flow conditioner in salt and powdered food products, the company says. The new product joins the family of "Flo-Gard" silicas. UNION CARBIDE CORPORATION's Specialty Chemicals Division has introduced a new silicone antifoam emulsion that has demonstrated superior efficiency over a wide temperature range, according to the company. The new product, "SAQ" Mark X, is a silicone antifoam emulsion designed for enhanced performance in aggressive foaming media.